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IMPERIAL BUREAU OF ANIMAL HEALTH

THE

# VETERINARY BULLETIN

Vol. 9.] January, 1939. [No. 1

## DISEASES CAUSED BY BACTERIA AND FUNGI

CHAPMAN, G. H., BERENS, C., NILSON, Edith L., & CURCIO, Lillian G. (1938). **The Differentiation of Pathogenic Staphylococci from Non-Pathogenic Types.**—*J. Bact.* **35.** 311-334. 2 figs., 8 tables. [Numerous refs.]

The pathogenicity of 400 staphylococcal strains from various sources was compared by rabbit inoculation and certain *in vitro* tests. The coagulase test with human or rabbit plasma was most reliable for the differentiation of pathogenic from non-pathogenic strains. The degree of pathogenicity was best estimated by haemolysis of rabbit-blood-agar, together with pigment and coagulase tests. —R. O. MUIR.

POCHON, J. (1938). Recherches immunochimiques sur la bactéridie charbonneuse encapsulée et sur une souche non-capsulée d'*anthracoides*. [**Immuno-Chemical Investigations on Capsulated Strain of** *Bacillus anthracis* **and on a Non-Capsulated Strain of** *B. anthracoides*].—*C. R. Soc. Biol. Paris.* **127.** 1185-1187. [2 refs.]

P. analysed culture filtrates of capsulated anthrax and non-capsulated anthracoid strains with regard to nucleoprotein, somatic and capsular substances. The somatic antigens of virulent, attenuated and avirulent anthrax strains were identical, but there was a slight immunological difference between the nucleoproteins of capsulated anthrax strains and anthracoid strains.—R. O. MUIR.

I. BOQUET, A., & SAENZ, A. (1934). Infection charbonneuse et essais de vaccination du cobaye et de la souris par voie sous-cutanée. [**Subcutaneous Vaccination of Guinea Pigs and Mice against Anthrax**].—*Mem. Prof. Jean Cantacuzène.* pp. 47-57. [15 refs.] Paris: Masson et Cie.

II. Combiesco, D., Stamatesco, & Aubert. (1934). Sur la dissociation d'une souche de bactéridie charbonneuse. [**Dissociation of a Strain of** *Bacillus anthracis*].—*Ibid.* pp. 197-206. [6 refs.] Paris: Masson et Cie.

III. Robyn, G. (1937). Comportement de deux races de *B. anthracis* entretenues depuis plusieurs années sur gélose oxalatée. [**The Behaviour of Two Strains of** *B.a.* **Maintained for Several Years on Oxalated Agar Medium**]. —*C. R. Soc. Biol. Paris.* **126.** 938-939. [1 ref.]

IV. Robyn, G. (1937). Comportement comparé du cobaye et de la souris vis-à-vis d'une race atténuée de *B. anthracis.* [**The Reaction of Guinea Pigs and Mice to an Attenuated Strain of** *B.a.*]—*Ibid.* 940-942. [3 refs.]

I. The authors assessed the rate of dispersal of anthrax bacilli from injection sites (tip of tail in mice and into the skin of the flank in g. pigs) by amputation of the tail in the mice and excising the skin around the zone of diffusion in g. pigs at varying intervals. For similar reasons they injected the plantar pads of g. pigs, bled the animals to death at varying intervals by heart puncture and tested the blood, the spleen and the popliteal lymph node of the inoculated leg by injections into mice. They conclude that invasion by the blood stream precedes by several hours that by the lymphatics, but that the gravity of the disease depends more on an early massive invasion of the internal organs than on the local reaction to the injection.

The authors show that compared with the skin the subcutaneous tissues of g. pigs can withstand 2-5 times the number of spores of Pasteur's second vaccine, and that there is an absence of the skin necrosis and haemorrhagic lesions which occur after intradermal inoculation.

They review previous attempts at anthrax vaccination of laboratory animals, and show by their experiments that immunity results from a gradual tolerance on the part of g. pigs and mice to an increasing number of anthrax bacilli, and depends on the method of inoculation and on the intervals between the several inoculations. The subcutaneous route was found most satisfactory, and a region least sensitive to the inoculations should be chosen for each species of animal.

II. The authors used a type R strain of *B.a.* isolated from a pig, and of high virulence. No S variants had been noted during ten years of sub-culture and laboratory experimentation. They succeeded in causing rapid dissociation of this strain into S variants by using media containing arsenic. These variants required sub-culture every eight days for conservation, but their virulence for mice decreased gradually to a low degree during this process. Several dissociation experiments with the R and S types are detailed.

Finally the authors show that vaccination of rabbits by intradermal or subcutaneous inoculations with S variants protected them against R strains.

III. R. maintained two strains of *B.a.* on agar to which 25 drops of a 1% solution of calcium oxalate had been added per tube. Type A was fully virulent for g. pigs, and sporulating. Type AA was derived from type A by sub-culture on agar to which 5 drops of calcium chloride had been added per tube; it was avirulent for g. pigs, appearing in the form of non-sporulating, very thin filaments.

The characters of type A were fully maintained after seven years of sub-culture. Type AA remained avirulent, but regained some of its sporulating power, the spores being small and very polymorphological.

Media therefore influenced the virulence and morphology of *B.a.* strains. Gradual lessening of virulence of *B.a.* on ordinary agar appears to be due to free calcium ions in this medium.

IV. Injection (subcut.) of strain AA referred to in III was found to be lethal for mice within 2-4 days without causing any oedema. P.M. examination showed

congested liver, a dark, swollen spleen, peritoneal hyperaemia, and sometimes congestion of the lungs. Encapsulated bacteria were numerous in the organs and heart blood.

R. found that peritoneal fluid of g. pigs was lytic for this strain of *B.a.*, whereas mouse fluid was not.

The reactions of g. pigs and mice to large injections (intraperit.) are tabulated. All the animals died. Death of the g. pigs was evidently due to intoxication by the bacillary capsular substance in the peritoneal cavity, while the mice died of a bacteraemia leading to a similar intoxication, but brought about by distribution of the capsular substance (on the bacteria) throughout the body.—C. V. WATKINS.

SELTER, H., & SCHÜRMANN, E. (1937). Das Vorkommen von Tuberkelbacillen in gesunden Organen und seine Bedeutung für die Fleischbeschau. [**The Occurrence of Tubercle Bacilli in Healthy Organs and the Importance of this Fact in Meat Inspection**].—*Z. Hyg. InfektKr.* **119.** 617-622. [9 refs.]

In order to determine whether tubercle bacilli are to be found in the apparently normal organs of animals showing localized TB. at meat inspection, the authors prepared cultures (on Petragnani's medium) from suspensions of tissue taken from macroscopically lesion-free lungs, livers, spleens and kidneys of a total of 22 cattle and pigs with localized and established (not early) TB. lesions in one or other of these organs. Sections were also made for microscopical examination. Five cultures of acid-fast organisms developed, and were typed by Petragnani's culture method ; by this test one was bovine, three were human and one was of an undetermined type of tubercle bacillus. On animal inoculation all were non-pathogenic.

The authors draw attention to this error of the cultural method and condemn its use in diagnosis, agreeing with GRIFFITH (1935) and with JENSEN [both in *Quart. Bull. Hlth. Org. L.o.N.* **4.** 866 and 869.] that much of Löwenstein's blood culture results are fallacious.—J. E.

I. ZIEGLER, M. (1937). Weitere Untersuchungen über das Zellbild der Milch bei tuberkulöser Mastitis. III. Mitteilung. [**The Cell Content of Milk in Tuberculous Mastitis. III**].—*Z. InfektKr. Haustiere.* **51.** 176-184. 4 figs. [See also *V. B.* **5.** 648].

II. PALLASKE, G. (1938). Verwendung eines Milchzentrifugatschnittverfahrens zur Diagnose der Eutertuberkulose. [**Diagnosis of Udder TB. by Microscopic Examination of Sections Cut from Milk Centrifuge Deposit**].—*Z. Fleisch- u. Milchhyg.* **48.** 201-207. 3 figs., 2 tables.

I. Z. considers that a search for epithelioid cell groups and for giant cells is of great value in the diagnosis of TB. of the bovine udder, firstly because it may facilitate considerably the finding of tubercle bacilli, and secondly because, if acid-fast bacilli and typical cells are found, errors in positive diagnosis are unlikely. He recommends that films should be prepared according to the method put forward by Cowan and Maddocks, and that a preliminary search should be made for acid-fast bacilli. If these are not quickly found, a search should be made for cell groups, particularly at the edge of the slides. If cell groups are found, further search must then be made for tubercle bacilli, which are then usually easy to find. The combination of a search for cell groups and acid-fast bacilli will, however, not detect all cases even when clinically suspected.

Z. reports the finding of typical cell groups in 313 out of 861 cases (36%) in which tubercle bacilli were also found at the time, and in 218 cases in which they were found later.

II. P. agrees with ZIEGLER [p. 3] and KUHLMANN [*V. B.* **7.** 4.] in attaching considerable importance to a cytological examination of milk as an aid to the diagnosis of udder TB. He describes methods involving the embedding of centrifuge deposit in gelatin or paraffin and the examinations of serial sections. He claims that a clearer picture is obtained and states that, from a comparison of the results of the examination of films, sections and g. pig inoculation on 64 samples of milk, the section method was slightly better than the film method. There was, however, agreement in most cases, *viz*, in 33 cases all three methods gave positive results, and in 22 cases all were negative.—A. W. STABLEFORTH.

CIUCA, A. (1934). Une enzootie de tuberculose ovine en Roumanie. Valeur diagnostique des réactions à la tuberculine chez le mouton. Caractères anatomo-pathologiques des lésions. [**Ovine TB. in Rumania. Value of Tuberculin Tests on Sheep. Pathological Characters of the Lesions**].—*Mém. Prof. Jean Cantacuzène.* pp. 185-196. [2 refs.] Paris : Masson et Cie.

After a short review of the literature on ovine TB. to illustrate the rarity of the disease, C. describes an outbreak with high mortality amongst both ewes and lambs. In his opinion, sheep are very receptive to natural TB. under special conditions of exposure, such as in the present case where dairy residue was fed to them. He considers that infection of sheep by direct contact, if not impossible, is at least exceptional under natural living conditions. This statement he bases on his findings with 20 lambs which remained uninfected in spite of prolonged contact with infected animals, on the scarcity of bacilli in the lesions, and on the abattoir statistics of every country. That sheep possess a certain degree of resistance to natural infection is shown by the limited development and advanced calcification of the lesions.—R. O. MUIR.

URBAIN, A., & DECHAMBRE, E. (1937). Un cas de tuberculose chez un éléphant d'Afrique. [**TB. in an African Elephant**].—*Bull. Soc. Path. exot.* **30.** 834-836. [4 refs.]

The authors state that this is the first recorded case of TB. in an African elephant ; the animal was in the zoological gardens, Paris. *Ante-mortem* symptoms were absent. Autopsy revealed about 50 litres of serous fluid in the peritoneal cavity. Lardaceous adhesions were observed between the pulmonary and costal pleura. Both lungs showed purulent foci enclosed in fibrous tissue and the left lung contained innumerable pus granules, about the size of a millet seed, scattered throughout the congested tissue. The pus contained numerous tubercle bacilli of undetermined type.—R. O. MUIR.

CUNNINGHAM, O. C., & ADDINGTON, L. H. (1936). **Tuberculosis in Milk Goats.**—*J. Dairy Sci.* **19.** 435.

In a herd of approximately 70 goats at New Mexico Experiment Station, two were found to be tuberculous at the first herd test in 1931, and since 1931, five more goats have reacted to the tuberculin test. On P.M. examination three goats showed pronounced tuberculous lesions and three others minor lesions that may or may not have been tuberculous. [No details concerning the remaining goat].—N. J. S.

PIASECKA-ZEYLAND, E. (1937). Rapport entre la fréquence des bacilles tuberculeux dans les laits du commerce et celle des bacilles du type bovin chez les malades à Poznan (Pologne). [**TB. of Bovine Origin in Poland**].—*Rev. Hyg. Med. prév.* **59.** 540-542. [Abst. from abst. in *Brit. med. J.* Feb. 19th, 1938. p. 32. of Epit. Curr. med. Lit.]

The author cultivated and typed 160 strains of tubercle bacilli from human patients at Poznan affected with various forms of TB. Eleven strains were of the bovine type, two strains coming from abattoir workers with a skin infection. Nine out of 31 samples of milk bought in the open market at Poznan contained tubercle bacilli, but it is considered surprising that the incidence of infection with the bovine type bacilli was not higher, among the patients examined.

VALLÉE, H. (1938). En marge de la prémunition antituberculeuse. [**Premunition against TB.**]—*Bull. Acad. Méd. Paris.* **119.** 116-122. [11 refs.]

In reviewing his researches on immunization against TB. from 1909 to the present day, V. refers to his methods of vaccination with live bovine tubercle bacilli of low virulence and suspended in an unabsorbable vehicle. He also refers to the results obtained by this method when the bacillus of Johne's disease is used for immunization against that infection [*V. B.* **5.** 601].—R. O. MUIR.

BERG, W. N. (1936). **A Standard Method for Testing Anti-Tuberculosis Vaccines.** —*Tubercle, Lond.* **17.** 502-508. 1 fig. [18 refs.]

B. describes in detail a suggested standard method of carrying out a " longevity test " on g. pigs. He describes the selection of g. pigs of even weight, tested intradermally for TB. and fed on standard rations which do not reduce natural immunity to tuberculosis.

The vaccine is tested for toxicity, and infective and re-infective doses are given to the test animals. An interval of six weeks between the last immunizing injection and the first infective dose is recommended, and the size of the infective dose is suggested. Details of technique at each stage of the method are indicated.—H. B.

COSTIL, L., & BLOCH, F. (1938). Réactions de la membrane chorio-allantoïde de l'embryon de poulet aux bacilles tuberculeux humains et aviaires. [**The Reaction of the Chorio-Allantoic Membrane of the Hen's Egg to Avian and Human Tubercle Bacilli**].—*C. R. Soc. Biol. Paris.* **128.** 40-42. [2 refs.]

Two human and three avian strains of tubercle bacilli were inoculated into ten-day chick embryos. Histological examination from the third to the tenth day showed a diffuse reaction—chiefly presence of monocytes—persisting throughout embryonic life in the case of the avian strains, but with the human strains becoming localized to macroscopic nodules after the seventh day.—R. O. MUIR.

TAYLOR, J. B. (1937). **Studies on Haemorrhagic Septicemia.**—*J. Amer. vet. med. Ass.* **91.** 182-185. [1 ref.]

Identification of cultures of *Pasteurella bubaliseptica* show that it belongs to Jones' Group III. Production of exotoxin and of endotoxin is described. Toxoid is produced by formolizing the filtrate, precipitation by acetone, redissolving in 0·85% saline and formolizing, tests being made on rabbits. Intravenous injection of solution of sodium bicarbonate or of neoarsphenamine failed to protect rabbits against the lethal effect of injection of cultures. *P.b.*, unlike most pasteurella bacteria, does not lose bipolar characters or pathogenicity after cultivation on artificial media. Toxoid, aggressin and bacterins when tested on rabbits failed to produce sufficient immunity to protect against inoculation with live organisms. —H. BURROW.

ROTT. (1938). Observations sur une épizootie de pleuro-pneumonie bovine. [**An Outbreak of Pleuro-Pneumonia in Cattle, Accompanied by Pasteurella Infection**].—*Réc. Méd. vét.* **114.** 270-272.

An outbreak [apparently haemorrhagic septicaemia] in which pneumonic lesions were prominent, occurred on one farm in the Department of Charente

Inférieure, France, and then spread to three neighbouring farms, where the disease assumed the pectoral-intestinal form. Stained blood films revealed pasteurella-like organisms, and cultural examination of the drinking water yielded, amongst other organisms, some which had the cultural characters of *Pasteurella*.

Intravenous injections of an aqueous solution of gonacrine gave very good results.—GWILYM O. DAVIES.

WOHLFEIL, T., & BECKER, H. (1937). Ueber Tularämie. **[Tularaemia].**—*Veröff. Volksgesundheitsdienst. Berl.* **50.** No. 3. 35-64. 2 tables. [Numerous refs.] Berlin: Richard Schoetz. [8vo] [RM.2.40].

This is an excellent systematic account of tularaemia, with an extensive bibliography. All aspects of the disease are dealt with, both veterinary and medical, so that the essay is of great value as an authoritative reference book.—J. E.

KRUMWIEDE, Elma, & KUTTNER, Ann G. (1938). **A Growth Inhibitory Substance for the Influenza Group of Organisms in the Blood of Various Animal Species. The Use of the Blood of Various Animals as a Selective Medium for the Detection of Hemolytic Streptococci in Throat Cultures.**—*J. exp. Med.* **67.** 429-441. 7 tables. [12 refs.]

The authors consider 5% sheep blood agar to be a selective medium for beta-haemolytic streptococci in mixtures with bacillus X (*Haemophilus haemolyticus*), since sheep blood inhibits the growth of the *Haemophilus* group. The inhibitor is shown to reside in the red cells, to be thermolabile and to be unaffected by haemolysis. The blood of animals closely related to the sheep, such as the goat and the cow, similarly inhibits the growth of haemolytic and non-haemolytic members of the influenza group, while human blood contains a similar but less powerful inhibitor for these organisms. The inhibitor in the blood of the various species is destroyed by heating at 68°C. for 30 minutes. Bacteria of the influenza group grow well on unheated rodent blood and fairly well on horse blood.—R. O. MUIR.

DAVIS, C. R. (1938). **Colibacillosis in Young Chicks.**—*J. Amer. vet. med. Ass.* **92.** 518-522. 3 tables.

*Bacterium coli commune* was isolated from chicks in four flocks, all obtained from the same hatchery, where conditions were found to be unsatisfactory.

Experimentally, chicks from this hatchery were found to be susceptible to infection by *B.c.c.*, whereas chicks from another hatchery proved completely resistant.

It is concluded that faulty incubation results in lowered vitality in the chicks, and that *B.c.c.* is pathogenic to such chicks.—W. J. IRONSIDE.

DI MARCO, R. (1937). Il metodo di Wulff nella pullurosi sperimentale. **[Viability of *Salmonella pullorum* in Bone-Marrow].**—*Profilassi.* **10.** 146-147. [15 refs.]

The author infected pigeons with *S.p.*, and on their death removed long bones and kept them in powdered charcoal. Pigeons were then inoculated with emulsions of the bone-marrow at two-day intervals. The organisms maintained their virulence until the eighth day, but were not infective to pigeons after that interval. Smears made from the marrow after the 14th day did not reveal the presence of *S. pullorum*. [No details of methods used].—J. A. NICHOLSON.

SOUSSOKO, B. (1938). Sur la typhose aviaire à Dakar. **[Fowl Typhoid in Dakar (French West Africa)].**—*Bull. Serv. Zootech. Epiz. A.O.F.* **1.** 7-9.

A description of the isolation of *Salmonella gallinarum* from diseased birds in Dakar.—D. L. HUGHES.

GRAHAM, R., BRANDLY, C. A., & DUNLAP, G. L. (1938). **Studies on Duck Septicemia.**—*Cornell Vet.* **28.** 1-6. 3 figs. on 2 plates. [3 refs.]

The disease described occurred in a duck-fattening plant every spring over a period of 4-5 years. It broke out when the eight-week-old ducks were moved from the brooders to the fattening sheds. The total mortality was more than 4,000.

Symptoms such as drowsiness and weakness were rapidly succeeded by diarrhoea and emaciation, death often supervening within 24-48 hours of the onset of symptoms.

On P.M. examination septicaemic lesions such as petechial haemorrhages on the serous membranes of the liver, heart, lungs and mesentery were observed. Fibrinous pericarditis, and congestion of the lungs and kidneys were also noted. In subacute cases there was marked distention of the horny beak with fluid.

A bacterium was consistently isolated in pure culture from the heart blood, spleen, liver, peritoneal cavity and bone-marrow of affected ducks. This organism was a Gram-negative rod, non-motile, non-sporulating and non-haemolytic; it occasionally showed filamentous forms. It failed to ferment carbohydrates and alcohols, and did not produce indol or $H_2S$. The authors call the organism *Pfeiferella anatipestifer* owing to its resemblance to the organisms described by HENDRICKSON and HILBERT [*V. B.* **3.** 178].

The disease could be reproduced by the inoculation of ducks with cultures of the organism.—D. L. HUGHES.

I. GILBERT, S. J. (1937). **A Short Review of Successful Progress in Eradication of Contagious Bovine Abortion in Palestine.**—*J. comp. Path.* **50.** 335-337.

II. MCEWEN, A. D. (1938). **The Control of Contagious Abortion.**—*Vet. Rec.* **50.** 699-712.

III. MCEWEN, A. D. (1938). **The Cost of Controlling Contagious Abortion in a Large Self-Contained Herd.**—*J. Minist. Agric.* **45.** 28-37. 4 tables. [Reprinted in *Vet. Rec.* **50.** 712-717].

I. Importation of cattle into Palestine resulted in spread and increased incidence of bovine brucellosis. The gradual growth of voluntary control and eradication measures are traced. The basis of control is segregation of reactors to the agglutination test, using a heavy final emulsion equal to a 1 : 6,400 suspension of barium sulphate. A titre of 1 : 25 is taken as the positive standard. The complement-fixation test is used as a check. The results have been successful.

Examples of some anomalous results are given. The sudden appearance in a clean herd of a reactor at a titre of 1 : 50 is regarded as of little significance, the animal usually ceasing to react within a year and spreading no infection in the herd.

II. Control methods were based on short-interval aggl. tests, segregation of clean and infected animals, and use of calving-boxes; the latter prevented spread of infection from the cows which failed to react to the aggl. test until some time after parturition. It is recommended that control measures be initiated when the disease in a herd is relatively quiescent. The role of vaccines is discussed, and reference made to the use of Meyer and Huddleson's rough, non-agglutinable, non-virulent strain of *Br.a.* as a source of vaccine [*V. B.* **8.** 77].

The promising results obtained by COTTON, BUCK and SMITH in vaccination of calves with *Br.a.* vaccines of reduced virulence are discussed [*V. B.* **5.** 119 and 196]. Calf-vaccination possesses an advantage in that agglutinins so produced disappear in later life and so do not nullify the application of the aggl. test when the animals become adults.

A general discussion is appended.

III. The author describes how, at a direct total cost of approximately £40, contagious abortion was controlled over a period of six years in a self-contained herd of 180 cows. Control was effected by aggl. tests of the whole herd at intervals of two months for the first six months, followed by tests twice yearly.

After the first 18 months, only one new reactor was revealed. The clean and infected groups of animals were segregated and the reactors were disposed of as soon as economically possible.

The breeding-history of the reactors is tabulated ; a table is also given comparing the milk yields of the same cows before and after abortion, and shows an average decrease of 200 gallons in the lactation following abortion.

The simplicity of control of contagious abortion in self-contained herds under ordinary farm conditions is indicated.—H. Burrow.

—. (1936). **Results of Four Tests of 2,801 Herds Infected with Bang's Disease.** —*Cornell Vet.* **26.** 357.

The article reports the success of the method of systematic retests and disposal of reactors in the control of brucellosis, giving results for 2,801 herds in five Middle West states. One original test and three retests were made, each owner taking measures to prevent reinfection of his herd.

At the original tests, all herds contained some infected cattle ; at retest, 44·2% of herds were free from infection, at the third test, 54·2%, and at the final one, 75·3% ; the percentage of the total reactors dropped from 26·7 to 2·7, the number of reactors removed being balanced by additions and replacements.

Four probable causes of infection remaining after the fourth test are given as :– extremely virulent initial infection ; carelessness in purchase of replacements ; neglect of sanitation, and over-confidence in the health of cows in a heavily infected herd which pass only one negative test.

Itabashi, K., Watanabe, S., Ito, S., Tajime, Y., & Otaki, K. (1937). **Studies on Contagious Abortion in Sheep. II. Epizootiological Observations on Ovine Brucellosis among Sheep at the Paichengtzu Sheep-Farm in Lungkiang Province, Manchoukuo.**—*J. Jap. Soc. vet. Sci.* **16.** 456-476 of pt. 1. 7 tables. [2 refs.] [In Japanese : abst. from English summary pp. 63-65 of pt. 2]. [See also *V. B.* **8.** 136].

Watanabe, S., Tajima, Y., Ito, S., Itabashi, K., & Yoda, H. (1937). **Studies on Contagious Abortion of Sheep. III. Outbreak of Brucella Abortion among Sheep at the Linsi Sheep-Farm and its Prevention by Vaccination with Lanolin-Live Vaccine.**—*Ibid.* 477-493 of pt. 1. 11 tables. [5 refs.] [In Japanese : abst. from English summary pp. 66-68 of pt. 2].

II. Bacteriological examination of 33 aborted foetuses from a sheep farm where undulant fever prevailed amongst the farm-workers revealed *Br. melitensis* as the cause of infection. The organism was also isolated by cultivation from the vaginal mucus and milk of several ewes about three weeks after abortion. Serological examination of the blood of 34 ewes that aborted proved positive by agglutination and complement-fixation in 29 cases. Sera of 69 rams all showed a negative reaction.

III. Vaccination of 1,640 sheep, 2-3 months before mating, with lanoline-live vaccine, is claimed to have reduced the abortion incidence from 19% to 6·4%. Losses sustained after vaccination were investigated and bacteriological work was done on some of the cases, *Br.m.* being detected in 24 out of 30 aborted foetuses,

as well as in the after-birth of a ewe which delivered normally. Some deaths in young lambs were also found to be associated with the infection, being more numerous in the progeny of ewes strongly positive serologically, than in those of negative reactors. The great majority of aborting ewes delivered normally the following year.—R. O. Muir.

Bosworth, T. J. (1937). **The Susceptibility of the Wild Rat to Infection with *Brucella abortus*: A Preliminary Note.**—*J. comp. Path.* **50.** 345-349. [3 refs.]

B. infected 13 out of 21 rats caught on brucella-free premises, by feeding ground-up spleen of *Br.a.*-infected g. pigs on one or on successive days. Most of the rats had been tested previously for brucella agglutinins in serum dilutions of 1 : 10 and upwards, with negative results. Later, serum tests showed that many of the rats became infected without obvious disturbance of their health. Large doses ($5 \times 10^7$) of living organisms injected intraperitoneally also caused no ill effects in wild rats. Apart from slight enlargement of the spleen, no gross lesions of disease were observed in rats killed at varying intervals after injection.

The tissues of rats from which cultures of *Br.a.* were obtained included heart blood, spleen, liver, pharyngeal and mesenteric lymph nodes, epididymis and kidney. Cultures were obtained from the urine, but not from the faeces. These cultural findings suggested distribution by the lymph stream and later by the blood, and excretion through the kidneys.

Infection by passage from rat to rat in close contact was proved in three out of eight experiments.—C. V. Watkins.

Ghinelli, I. (1938). L'infezione brucellare nei Piccioni in avitaminosi. **[Brucellosis in Avitaminotic Pigeons].**—*Nuova Vet.* **16.** 156-161. 3 tables.

G. was unable to increase the susceptibility of pigeons to brucella infection by keeping them for some months on a diet deficient in vitamin B complex. The virulence of the organism remained unchanged for g. pigs after repeated passage through pigeons affected with avitaminosis. After inoculation a few pigeons showed a rise of temperature and an agglutination titre of 1 : 1,000, but P.M. examination of such birds did not reveal lesions of brucella infection. It is concluded that birds [sic] are highly resistant to a natural brucella infection.—J. A. N.

Millenbruck, E. L. (1938). **The Control and Eradication of Infectious Abortion in Swine.**—*Vet. Bull. U.S. Army.* **32.** 137-141.

It was suspected that contact with infected pigs might have caused cows to give a positive reaction to the agglutination test for *Brucella abortus*. An investigation of *Br.a.* infection in swine was therefore undertaken. The types of abortion —infectious and non-infectious—are described, the former being divided into non-specific and specific, the specific causes being *Br.a.* (porcine type), whereas the non-specific are various kinds of cocci. Diagnosis is by the aggl. test, titres of 1 : 100 to 1 : 200 being regarded as definitely positive, while agglutinations at a titre of 1 : 50 are regarded as suspicious.

The technique of collecting blood-samples from pigs is described in detail. It is advised that litters from reacting sows be reared in isolation for 120 days, as such litters are infected when born, but infection disappears after that period. Emphasis is laid on the danger to human beings from contact with the porcine type of infection.—H. Burrow.

Dayus, C. V. (1938). **Vaccination of Ewes against " Pulpy Kidney ". Trials in Otago and Southland, Season 1937.**—*N.Z. J. Agric.* **56.** 25-27. 2 figs., 2 tables. [See also *V. B.* **7.** 269].

The author discusses the results of the season's vaccination of pregnant ewes with formalinized whole culture of *Clostridium welchii* Type D. Of 11,600 lambs born of vaccinated ewes, losses due to " pulpy kidney " [enterotoxaemia] were 1·025 % ; of 15,768 born of unvaccinated controls, 2·086 % died of " pulpy kidney ". Ewes were vaccinated twice, first approximately six weeks before, and secondly as soon as possible after lambing.—L. W. N. Fitch.

Rose, A. L., & Edgar, G. (1936). **Entero-Toxaemic Jaundice of Sheep and Cattle. A Preliminary Report on the Aetiology of the Disease.**—*Aust. vet. J.* **12.** 212-220. 2 figs. [16 refs.]

The authors discuss the similarity of " toxaemic jaundice of sheep ", " haemolytic jaundice of sheep " and " yellows " and a condition affecting calves known as " ictero-haemoglobinuria of calves ". A detailed description of each disease is given. As the outstanding characteristics of each are an intense icterus associated with haemoglobinaemia and haemoglobinuria, and since a haemolytic toxic bowel filtrate was obtained from cases in both sheep and cattle, the authors suggest that the diseases are identical and should be called " entero-toxaemic jaundice of sheep and cattle ". In the cases investigated, it appeared that *Clostridium welchii* type A was the causal organism. In studying toxin-antiserum and culture-antiserum relationships, they noted that whereas *Cl.w.* type D antiserum would protect against type A toxin it would not afford protection against one M.L.D. of whole culture of type A inoculated intramuscularly, thus confirming reports by other workers.—T. S. Gregory.

I. van Saceghem, R. (1938). Production du vaccin contre le charbon symptomatique au laboratoire vétérinaire de Kisenyi. [**Production of Blackleg Vaccine in the Veterinary Laboratory at Kisenyi (Belgian Congo)**].—*Bull. Soc. Path. exot.* **31.** 472-474.

II. Martin, L. A. (1938). Culture de *Clostridium chauvoei* et préparation d'un vaccin contre le charbon symptomatique. [**Cultivation of *Cl.c.* and Preparation of Blackleg Vaccine**].—*C. R. Soc. Biol. Paris.* **127.** 1059-1061. [1 ref.]

I. Vaccine was prepared from a virulent strain of *Cl.c.* in liver broth medium layered with vaseline, details concerning preparation being given. After good growth had occurred, 0·5 % formalin was added. When sterile this was issued as vaccine. The dose was 10 c.c., and immunity was shown to last at least six months.

II. M. used a medium similar to that mentioned above, but added 0·1 % of glucose. He inoculated 5-litre flasks with a portion of muscle from a g. pig newly dead from *Cl.c.* infection. After 1-4 days' incubation the culture was killed by the addition of 0·6 % formalin and issued as vaccine.—P. S. Watts.

## DISEASES CAUSED BY PROTOZOAN PARASITES

Hornby, H. E. (1937). **Pathology and Therapeutics of Nagana : An Appeal.**—*J. comp. Path.* **50.** 312-313.

Attention is drawn to the neglected field of pathology of animal trypanosomiasis. The following are not yet known for certain :- (a) the distribution of any species of trypanosome within its host at any stage of infection ; (b) the manner

in which any species of trypanosome affects its host ; (c) the nature of immunity responses to infection ; (d) the extent to which the action of any drug is direct or indirect ; (e) where the destruction of trypanosomes as the result of drug action takes place ; (f) whether sterilization is ever the result of drug action without necessity for clearing up of stragglers by antibodies, and (g) why similar treatment should give different results with similar individuals infected with the same strain of trypanosomes.—J. A. GRIFFITHS.

STEEVENSON, G. F. (1938). **The Application of the Mercuric Chloride Test in an Outbreak of Surra in Waziristan.**—*J. R. Army vet. Cps.* **9.** 83-85.

S. states that, from experience gained in this outbreak, the mercuric chloride test appeared to be unreliable for the detection of very recent infection in camels. In some cases reactions were not positive until two weeks after infection. After treatment with naganol the reaction persisted for about a month. Valuable notes on the procedure to be adopted when dealing with an outbreak, and on prophylaxis, are incorporated in the article.—D. D. OGILVIE.

FRENCH, M. H. (1938). **Studies in Animal Trypanosomiases. I.—Nitrogen and Mineral Metabolic Disturbances Induced by** *Trypanosoma congolense* **and** *Trypanosoma brucei.* **II.—Disturbances Produced in the Plasma Proteins by** *Trypanosoma congolense* **and** *Trypanosoma brucei.* **III.—The Effects of** *Trypanosoma congolense* **and** *Trypanosoma brucei* **on Blood Urea.**—*J. comp. Path.* **51.** 23-45. 10 tables. [Numerous refs.]

During the course of experiments to ascertain the effect of diet on *Tryp. congolense* infection in cattle and sheep and *Tryp. brucei* infection in sheep, the opportunity was taken to study the metabolic disturbances caused by these parasites in the hosts under experiment. Both infections caused an increased excretion of nitrogen, body bases, chlorides and phosphates, the increased excretion of body bases being explained as an attempt to get rid of acidosis. A sufficiency of minerals in the diet was required to prevent geophagia. The increased nitrogen excretion was ascribed to increased endogenous protein catabolism consequent upon wasting and fever, the increased nitrogen being excreted in the urine.

No increase of blood urea was found to occur in either infection, except at the end of the disease, immediately prior to death, when it was ascribed to the result of general autolysis of body tissue. Variations occurred in the total blood plasma protein content, but such variations were not constant. The non-protein nitrogen of the blood only showed an increase at crisis or near death, or after injection of antimosan.

The albumin : globulin ratio of plasma proteins was diminished by both infections, the albumin fraction reaching a minimum at death or crisis, but returning to normal in 5-8 weeks after recovery. The globulin increase was due to a great increase in the proportion of euglobulin, the maximum being reached at the time of crisis or death. After recovery, the euglobulin content returned to normal in 10-12 weeks.

The increase of euglobulin was greater in severe cases of disease than in mild cases, and was greater in the *Tryp. brucei* infections of sheep than in the *Tryp. congolense* infections. In one case of *Tryp. congolense* infection in an ox, in which the trypanosomes persisted for a considerable period after crisis, the return of the euglobulin to normal was considerably delayed.—U. F. RICHARDSON.

HOARE, C. A., & BROOM, J. C. (1938). **Morphological and Taxonomic Studies on Mammalian Trypanosomes. IV. Biometrical Study of the Relationship between *Trypanosoma uniforme* and *T. vivax*.**—*Trans. R. Soc. trop. Med. Hyg.* **31.** 517-534. 5 figs., 6 tables. [Numerous refs.] [See also *V. B.* **8.** 19].

The authors undertook a statistical investigation on the significance of the variation in length between specimens of *Tryp. vivax* and *Tryp. uniforme*. Nine blood films of the former and five of the latter were used as material, and 100 individuals were measured in each preparation. It is concluded that strains corresponding to the two species fall into two distinct groups, which are characterized constantly by differences in the mean lengths and in the range of length of the trypanosomes, and that the measurement of ten individuals from any strain provides a satisfactory method of identification of the species. The systematic position of the two groups is discussed and it is concluded that their original status as separate species should be retained. [The number of films examined does not seem to justify this conclusion].—U. F. RICHARDSON.

VON BRAND, T. (1938). **The Metabolism of Pathogenic Trypanosomes and the Carbohydrate Metabolism of their Hosts.** *Quart. Rev. Biol.* **13.** 41-50. 1 fig. [Numerous refs.]

The author reviews the literature on the metabolism of trypanosomes and the theories as to their lethal mechanism. He concludes that there is no doubt that the carbohydrate consumption of trypanosomes is striking, in that they consume twice their own weight of sugar in 24 hours, and it appears that, as a rule, the pathogenic species consume more sugar than non-pathogenic species. *Tryp. cruzi*, however, appears to consume less than the non-pathogenic *Tryp. lewisi*. The sugar is only partially oxidized, the end-product being pyruvic acid. The fat and protein metabolism seem to be unimportant.

Infection appears to disturb the carbohydrate regulation of the host, the glycogen reserves are usually depleted, and there may be distinct hypoglycaemia a few hours before death. This hypoglycaemia is not, however, specific for trypanosome infections.

Three theories are presented to explain the disturbance of the carbohydrate metabolism of the host and its eventual death. One postulates that the consumption of carbohydrate is so great that a strain is thrown on the liver, leading to its failure to function and to a glycoprivic intoxication. This is criticized in that administration of sugar does not influence the course of the disease, and that the parasitic sugar consumption is not high enough to allow the assumption of effective interference with the host metabolism. Asphyxiation, due to blocking of the lung capillaries either by the agglutination of parasites or by lactic acid production, has been suggested as the cause of death, but has not found many adherents, and it has been shown that the lactic acid concentration is not great enough to inconvenience the host. A third theory suggests the production of other toxic end-products of trypanosome metabolism, and as proteolytic ferments have been detected in trypanosomes, it is suggested that a toxic amine may be produced.—U. F. RICHARDSON.

CULBERTSON, J. T. (1938). **Natural Transmission of Immunity against *Trypanosoma lewisi* from Mother Rats to their Offspring.**—*J. Parasit.* **24.** 65-82. 5 tables. [14 refs.]

Young rats born to dams recently recovered from *Tryp. lewisi* infection were immune for the first few weeks of life. That such immunity was acquired ***in utero***

was shown by the fact that such animals still proved immune when raised by susceptible foster-mothers. That the immunity could also be transferred in the milk was shown in the resistance displayed by the young of susceptible dams when raised by immune foster-mothers.—U. F. RICHARDSON.

CULBERTSON, J. T., & KOLODNY, M. H. (1938). **Acquired Immunity in Rats against *Trypanosoma cruzi*.**—*J. Parasit.* **24.** 83-90. 3 tables. [3 refs.]

In rats infected with *Tryp. cruzi*, blood infection was continuous for three weeks, and then became intermittent for two weeks, after which peripheral blood infection ceased. After recovery, the rats under experiment became immune to reinfection, though no trypanosome infection could be detected. Susceptible rats inoculated with serum from immune animals showed an increased resistance in that the incubation period was lengthened. Therapeutically, serum from immune animals caused a sharp decrease in the number of blood trypanosomes, but no permanent disappearance could be produced even with repeated injections. —U. F. RICHARDSON.

JOHNSON, C. M. (1938). **Cardiac Changes in Dogs Experimentally Infected with Trypanosoma cruzi.**—*Amer. J. trop. Med.* **18.** 197-206. 1 table. [12 refs.]

The cardiac changes noted in experimentally infected dogs appeared to be the same as those of the acute fatal infection in Chagas' disease in human beings. A chronic stage of this disease has been demonstrated in dogs ; the lesions differed only in intensity and in destructive character. In the experimental Chagas' disease in dogs the lesions occur more frequently in the outer and innermost layers of the myocardium : the central parts are less involved.

One of three strains used to infect dogs had been passaged a long time in g. pigs and it was less virulent than the other two strains obtained directly from human cases.—J. A. G.

KERR, W. R., & LAMONT, H. G. (1938). **Trichomonas Disease of Cattle. Observations in Northern Ireland.**—*Vet. Rec.* **50.** 730-731. [1 ref.]

The authors draw attention to wide-spread bovine sterility in Northern Ireland, this being due partly to trichomoniasis.

They give a clinical description of the disease complementary to that of STABLEFORTH, SCORGIE, and GOULD [*V. B.* **7.** 463]. The abortions commonly occur at a time corresponding to an oestral period ; there is a characteristic type of vaginal discharge and the membranes of the embryos have a white, macerated appearance. Local farmers say that repeated services " feed the disease and keep the discharge going " ; recovery is known to take place if several services are missed. Most cases occurred between September and January.

A medium for the cultivation of the parasites is described. Treatment was carried out by irrigation of the os uteri and vagina, and by filling the uterus with a 1 : 200 to 1 : 400 watery solution of iodine.—C. V. WATKINS.

SWARTZWELDER, J. C. (1937). **Studies on the Infection of Dogs with Trophozoites of *Endamoeba histolytica* by the Oral Route. A Preliminary Report.** —*Publ. Hlth Rep., Wash.* **52.** 1447-1451. [12 refs.]

Five out of 13 dogs were infected by the ingestion of trophozoites of *E.h.* from the cyst-free faeces of dogs experimentally infected with a human strain. In 14 out of 22 dogs, trophozoites traversed the stomach and small intestine in a viable state ; they also withstood *in vivo* concentrations of HCl up to amounts requiring 40 c.c. of N/10 NAOH to neutralize 100 c.c. of gastric juice. Combined HCl was without effect in high concentration.—R. O. MUIR.

Springholz-Schmidt, A. J. (1937). Zur Frage der Pferdenuttalliose. [**Equine Piroplasmosis**].—*Z. InfektKr. Haustiere.* **52.** 221-231. 1 table.

The author describes the disease of horses in Eastern Siberia first recognized as *Babesia equi* infection in 1933, and believed to have been introduced recently into the area. Until discovered in Siberia it was thought to be confined to South and central Russia. The disease in Siberia occurred in an acute form associated with a large type of parasite, and in a chronic form associated with a smaller type.

The author's investigations indicated that the disease was enzootic in the area, and that cases occurring in local animals must be ascribed to relapses. The chronic or latent form of the disease appeared most common, and was distinguished clinically by lassitude, weakness and anaemia, with slight fever. The large type of parasite occurred in the form of rings, ovals, pear-shaped individuals, and four individuals in the Maltese cross formation. The small type of parasite appeared in the same forms, but in addition, comma-shaped or rod-shaped organisms were encountered, and also anaplasma forms. The author discusses the evidence as to existence of two small species of *Babesia* in the horse, and the validity of the species *B. minor* of Sassuchin [*V. B.* **4.** 462.], but concludes that as the organisms appeared as a series which merge into each other they should all be included in the species *B. equi*.—U. F. Richardson.

Ivanova-Jobzem, P. S. (1937). Anaplazmoz ovec v Kara-Kalnakü. [**Anaplasmosis of Sheep in Kara-Kalpakia**].—*Sovyet. Vet.* Nos. 11-12. pp. 41-42.

An outbreak of *Anaplasma ovis* infection occurred in July-August in sheep in Kara-Kalpakia. The ticks which were abundant during June included *Hyalomma dromedarii, H. detritum, Rhipicephalus bursa* and *R. sanguineus.*

The blood corpuscle invasion is described; two thirds of the parasites were marginal and one third central in situation, and up to 2% of the R.B.C. were invaded.

The mortality in the sheep is not stated.

Davis, C. L., Stiles, G. W., & McGregor, A. N. (1938). **Coccidioidal Granuloma in Calves.**—*J. Amer. vet. med. Ass.* **92.** 562-563. [1 ref.]

Coccidioidal granuloma, particularly in the form of lung lesions, has hitherto been regarded as an affection of the adult bovine, but in this paper the authors record finding lesions in the thoracic lymph nodes of 23 out of 48 Hereford calves, 8-10 months old. Seven of these calves also showed slight granulomatous lesions in the lungs. The calves were from Madera County, California, and were slaughtered in Los Angeles.—Gwilym O. Davies.

Lafenêtre, H. (1938). Existence de " Rickettsia conjonctivae " du mouton dans le midi de la France. [*R. conjunctivae* **in Sheep in France**].—*Rev. Méd. vét., Toulouse.* **90.** 323-324. [1 ref.]

L. records the detection of *R.c.* in three flocks of sheep near Montpellier. The disease occurred as an acute conjunctivitis which might affect half the flock at one time. Conjunctivitis might persist for two days to a month and was sometimes accompanied by keratitis. On recovery the conjunctiva remained congested and characteristic granulations occurred under the eyelids. This condition is explained by the persistence of the rickettsia in the mucous membrane.—U. F. R.

1. Kamberis, E. (1937). La spirochétose des poules. [**Spirochaetosis in Fowls**]. —*Thesis, Alfort.* pp. 68. [Numerous refs.]

II. Pigoury, L. (1938). Infection expérimentale du pigeon par une souche virulente de *Spirochaeta gallinarum*. [**Experimental *Sp.g.* Infection in the Pigeon**].—*Bull. Soc. Path. exot.* **31.** 363-366. 1 table. [4 refs.]

I. A useful account of avian spirochaetosis, with special reference to its occurrence in Greece. The spirochaetes are considered to be protozoa, and it is claimed that during their development an ultravisable virus stage occurs. In Greece the disease is invariably acute, and is transmitted by *Argas reflexus*. Only one species of spirochaete is known to exist there. Although the parasites invade the ovary of the hen, the disease is not hereditary. Neither splenectomy nor thyroidectomy reduces the resistance of poultry to the infection.

II. P. records that he succeeded in setting up a fatal infection in a young pigeon with *Sp.g.* derived from a particularly virulent outbreak in poultry. Pigeons are considered to be resistant to natural avian spirochaetosis and, in most cases, to experimental infection.—Gwilym O. Davies.

Ivanic, M. (1937). Zur Kenntnis der gewöhnlichen Zweiteilung und der in den Leberzellen der Hausgans (*Anser domesticus* L.) vorkommenden multiplen Teilung (Schizogonie) bei *Leucocytozoon anseris* Knuth u. Magdeburg. [**Normal Binary Fission of *L.a.*, and Multiple Fission (Schizogony) Observed in the Liver Cells of the Goose**].—*Arch. Protistenk.* **89.** 16-44. 48 figs. on 2 plates. [Numerous refs.]

A case of *L.a.* infection in a young goose was examined histologically. In sections of liver fixed in Bouin's fluid there could be observed parasites in two stages of multiplication—ordinary binary fission with single nuclei and multiple fission with multi-nucleated plasmodia forms, one individual giving rise to many new cells each complete with its own nucleus; type of multiplication was characterized by (1) a large increase in the number of nuclei, and (2) limited increase in the number of nuclei; both types could be observed side by side. In the blood the parasites had the form of haemosporidia.—Sassenhoff (Munich).

I. Yakimoff, W. L. (1936). Zur Frage der Sarkozysten der Renntiere. [**Sarcocystosis in Reindeer**].—*Z. InfektKr. Haustiere.* **50.** 217-223. 4 figs., 2 tables. [5 refs.]

II. Gousseff, W. F. (1936). Beitrag zur Sarkozystosefrage. Verbreitung von Sarcocystis hirsuta. Art der Uebertragung und Toxität der Sarkozysten. [**Sarcocystosis. Incidence of *S.h.* Method of Transmission and Toxicity of Sarcocysts**].—*Ibid.* 214-216. 1 table.

I. According to the reports of other workers in Scandinavia, Alaska and Siberia adult reindeer are very frequently infected with sarcocysts. Y. examined and found sarcocysts in pieces of muscle from reindeer of Western Siberia.

II. Sarcocysts are common in cattle in certain countries, and in some countries all the cattle may be infected. Investigations in Switzerland showed that 6% of calves between six and eight months old and of cattle over 2½ years old were infected with sarcocysts, the tissues most commonly infected being the oseophagus, heart muscle, tongue and diaphragm. The mode of transmission is not known, but it is thought that infection occurs either *per os* or through " biting " flies. Sarcocysts have doubtful pathogenic action, but in association with other infections may perhaps cause illness, particularly in calves. G. considers that *Sarcocystis tenella* may occasionally be the cause of loss in sheep. G. observed three cases of sarcocystosis in cattle which had died of icterohaemoglobinuria in the Azov-Black Sea area.—F. Freudenberg (Hamburg).

## DISEASES CAUSED BY VIRUSES

I. Anon. (1938). **Foot-and-Mouth Disease in Great Britain.**—*J. Minist. Agric.* **44.** 943-958. 4 tables. [Reprinted in *Vet. Rec.* **50.** 254]. [See also *V. B.* **8.** 357].

II. Anon. (1938). **Foot-and-Mouth Disease.**—*Vet. Rec.* **50.** 267-268. [1 ref.]

I. This memorandum (dated 15.12.37) should be read in the original. The character of the disease and its history in Great Britain are discussed, as well as the methods adopted to deal with it, in particular the slaughter policy; the exceptional virulence of the 1937 outbreak is emphasized. General methods adopted to prevent the introduction of the disease are detailed. "Although it is not known whether birds can become infected, there is little doubt they can carry the virus mechanically." "There is strong circumstantial evidence pointing to the conclusion that the infection in Great Britain in October and November, 1937, was due to migratory birds acting as mechanical carriers." Preventive measures against this source of infection are not considered practicable.

The work of the Foot and Mouth Disease Research Committee continues; it includes the problem of immunization. Results obtained with serum from Germany are commented on. "Serum at present available cannot be relied upon to protect bovines from infection when intimately exposed to a highly infective case of the disease".

II. The importance of continuing the slaughter policy in Great Britain is emphasized. Figures show that during the peak period of the 1937-1938 outbreak, France had 12,873 outbreaks, Belgium 18,517, the Netherlands 81,066, and Germany 36,902, whereas of countries where the slaughter policy is enforced Switzerland had 273 outbreaks, Denmark 11 and Great Britain 236. The slaughter policy is an economic one, and although treatment is possible the difficulties of preventing the spread of an outbreak appear insuperable. Swift action is essential to stamp out infection. The high mortality in the outbreak here dealt with among young animals changed the adverse criticism of farmers to one of general support for an efficient slaughter policy, which is fully endorsed by the veterinary profession in the present state of our knowledge.—J. A. Griffiths.

I. Eccles, A., Longley, E. O., & Thomson, J. K. (1937). **The Demonstration of a Change in the Antigenic Structure of a Bovine Strain of Foot and Mouth Disease Virus during Serial Transmission in the Guinea-Pig.**—*J. comp. Path.* **50.** 412-420. 12 tables.

II. Hulse, E. C., & Edwards, J. T. (1937). **Foot and Mouth Disease in Hibernating Hedgehogs.**—*Ibid.* 421-430. 1 chart. [11 refs.]

I. In a previous report [*V. B.* **8.** 144.] mention was made of apparent mutations in strains of F. & M. disease virus after passage through g. pigs. One strain (147) when passed serially through g. pigs was apparently a pure "O" type at the 12th passage, but at the 15th it had entirely lost its "O" component and was definitely of the "C" type.

In this article it is reported that the original bovine material, after two years' storage in buffered glycerin, was again tested both in cattle and in g. pigs. It showed a relation to "O" and to "A", but had no affinity to "C". It was then transferred serially through g. pigs. At the ninth and tenth passages it behaved as a pure "O" with no indication of "A" or "C" components, but between the tenth and 13th transference there was again a sudden change in type. Animals immune to "O" and "A" respectively reacted with generalized lesions, whereas g. pigs protected against "C" were completely or almost completely resistant.

All three components were apparently detectable at the 12th passage. The significance of these findings is discussed.

II. Under normal conditions hedgehogs are highly susceptible to F. & M. disease virus, but they react poorly when they are hibernating. Experiments were undertaken to determine whether the virus would persist in animals infected in the active state and immediately induced to hibernate. The virus was introduced by the intranasal route and was localized to the respiratory tract by a dose of antiserum. Hibernation was induced by transferring the animals to a dark, cool room.

Virus was still present in high concentration in the lungs and was also found in other tissues after two months. In one animal which was kept for four months no virus was detected, but the feet showed healed lesions. One hedgehog was revived after 32 days; it showed well marked lesions of F. & M. disease three days later, and infected in-contact healthy hedgehogs.

Non-hibernating animals placed under cool conditions often reacted mildly to small doses of virus, but after recovery they were incapable of spreading the disease to in-contacts.

The importance of the hibernating hedgehog as a possible carrier of the virus is discussed.—R. E. Glover.

Waldmann, O., & Köbe, K. (1938). Die aktive Imunisierung des Rindes gegen Maul- und Klauenseuche. (" Vorläufige Mitteilung). [**The Active Immunization of Cattle against Foot and Mouth Disease (Preliminary Communication)**].—Distributed at International Veterinary Congress. Reprinted in *Berl. tierärztl. Wschr.* June 3rd. 317-320. 2 charts. [14 refs.]

The authors report success in the preparation of a vaccine which fulfils the following requirements :– (1) inability to cause F. & M. disease in cattle, (2) the production of a slight local and general reaction, (3) the production of an adequate immunity. Details of preparation of the vaccine are not given, but are promised later. In this paper it is merely stated that the vaccine is composed of virus adsorbed on to aluminium hydroxide, which is then submitted to a process to make the virus avirulent, but not to affect its value as an antigen. In an experiment on about 90 cattle, the vaccine protected against artificial infection 14 days after its application.

The vaccine has been used on 40,000 cattle in the field in an area north of Breslau. The results will be reported later.—J. E.

Waldmann. (1938). Riemser Maul- und Klauenseuche- (M.K.S.) Vakzine. [**The Riems Vaccine against Foot and Mouth Disease**].—*Dtsch. tierärztl. Wschr.* **46.** 569.

The technique of preparation of the vaccine is given as follows :– cattle are infected intradermally in the tongue with highly virulent material and after 24 hours the vesicle covering and contents are carefully collected under narcosis. The average yield of material from each animal is 30 g. The material is then ground up in an electric Lapatie apparatus for one hour, diluted to a strength of 7% in distilled water, centrifuged and filtered. Then a mixture is prepared of 50 litres of Wildstätter and Schmidt's aluminium hydroxide, 10 litres of the filtered virus suspension, 40 litres of glycocoll buffer of a concentration to ensure a final pH of 9·0, and lastly 50 c.c. of Schering's formalin. This mixture is stirred for one hour in a special large airtight electric mixer and finally decanted into one-litre bottles.

The bottles are placed in an incubator (25°C.) for 48 hours, then transferred to cold storage (3-5°C.) where they remain pending tests and dispatch. The dose for cattle is 15-60 c.c., according to weight. The vaccine is tested on experimental

cattle kept in careful isolation which, after inoculation, are shut up for seven days not even the attendant having contact; the animals are then observed for the nature of the reaction set up, again shut up for seven days, and then tested for immunity by rubbing the tongue with a cloth soaked in virus. If they do not react within seven days the batch of vaccine is issued for field use.

The vaccine has been used on 150,000 cattle with great success. Immunity is evident from the fourth or fifth day and lasts for 4-5 months as far as is at present known. It is claimed that vaccinated cattle possess an almost complete resistance to natural infection in outbreaks of F. & M. disease.—J. E.

Lignières, R. (1936). La vaccination antiaphteuse. [**Vaccination against Foot and Mouth Disease**].—*C. R. Acad. Agric. Fr.* **22.** 1042-1053. 3 tables.

L. applied his brother's vaccination technique [*V. B.* **4.** 513.] to a number of cattle in the field; of 124 animals vaccinated one cow contracted F. & M. disease two months after vaccination, five bulls after four months, and two other animals after nine months. The remaining cattle did not contract the disease although exposed to heavy infection. The vaccine itself did not produce any symptoms or lesions.—E. C. Hulse.

Ivanov, B. J. (1937). Novoe v izučenii patologo—anatomičeskih izmenenii pri encefalomielite lošadeí. [**Study of Pathologic-Anatomical Changes in Encephalomyelitis in Horses**].—*Sovyet. Vet.* Nos. 11-12. pp. 64-68.

The disease as seen in Russia is essentially a diffuse encephalomyelitis, like the American form, and in addition a parenchymatous hepatitis and signs of inflammation of the reticulo-endothelial system occur. The hepatitis is associated with bilirubinaemia and icterus, which Russian workers emphasize as a common symptom of the disease in Russia [but it is not characteristic of the American form]. Inclusion bodies have been observed in the brains of affected horses in Russia.

Pritchett, H. D. (1938). **Rabies in Two Gray Squirrels.**—*J. Amer. vet. med. Ass.* **92.** 563-564. [1 ref.]

This is a brief note on rabies in two grey squirrels (one wild) from Charlotte, North Carolina. The symptoms differed in the two animals; the tame squirrel attacked its owner, the wild squirrel was found partially paralysed on the ground. The disease was diagnosed by examination of the brains.

I. Lépine, P., & Sautter, V. (1937). Lésions du système nerveux dans la maladie d'Aujeszky. [**Lesions in the Nervous System in Aujeszky's Disease**].—*C. R. Soc. Biol. Paris.* **126.** 753-756. 3 figs. [3 refs.]

II. Nicolau, S., Cruveilhier, L., & Kopciowska, L. (1937). Lésions cytologiques et présence d'inframicrobes et d'inclusions dans les tissues d'animaux infectés expérimentalement avec le virus de la maladie d'Aujeszky. [**Cell Lesions and Presence of Viruses and Inclusion Bodies in the Tissues of Animals Experimentally Infected with Aujeszky's Disease**].—*Ibid.* 756-759. [10 refs.]

III. Remlinger, P., & Bailly, J. (1938). Sur la présence du virus d'Aujeszky dans la glande de Harder. [**Presence of the Virus of Aujeszky's Disease in Harder's Gland**].—*Ibid.* **127.** 657-658.

IV. Tuncman, Z. M. (1938). La maladie d'Aujeszky observée chez l'homme. [**Aujeszky's Disease in Man**].—*Ann. Inst. Pasteur.* **60.** 95-98. 1 fig. [1 ref.]

I. The authors describe the chief lesions of laboratory animals, principally

rabbits and mice, after infection by the virus of Aujeszky's disease. The C.N.S. is always more or less affected, generally corresponding in degree to the duration of the illness. The pia mater, more especially of the spinal cord, is infiltrated with polymorphonuclear and mononuclear leucocytes. The cephalic ganglia in addition to those of the spinal cord are at an early stage frequently the seat of an intense cellular infiltration and often of neuronophagia. The specific cellular reaction is minutely described and well illustrated, and the chief areas of the nervous system in which the reaction occurs are detailed. The cell changes include oxychromatic degeneration of the nuclei, and largely correspond to those seen in herpes. There is a great tendency to autolysis of the whole nervous system whatever the duration of the illness. These findings confirm those of HURST [*V. B.* **4.** 349].

II. The authors detail the chief tissues of laboratory animals affected by Aujeszky's disease. The invasion and the multiplication of the virus particles in the affected cells is extremely rapid following intracerebral injection. At first a large number of minute cocco-bacillary or rod-shaped virus particles are scattered between the chromatin elements of the nuclei. These multiply at the gradual expense of the chromatin, so that the nuclei become filled with virus particles 100-150 $m\mu$ in size. The virus particles tend to agglutinate into eosinophilic staining masses up to 2-4$\mu$ in diameter, with or without a halo, among the remainder of the virus particles.

In the fowl and pigeon the disease is slower in development, and a cell necrosis is more commonly seen than in the rabbit and g. pig.

Lesions in the plantar pads of g. pigs after intradermal inoculation of Aujeszky's disease virus show a cellular reaction very similar to that following inoculation of the virus of herpes.

III. The authors showed by transmission experiments that Harder's gland in cats and rabbits dead of Tunisian and Hungarian strains of Aujeszky's disease may contain the virus. They removed all traces of blood by repeated washings in distilled water and then prepared the material for inoculation; positive results were obtained in seven out of ten tests.

IV. The author describes two accidental infections of laboratory workers by this disease, both occurring as a result of hand injuries. In the first case an intense pruritis commenced at the finger and, travelling up the arm, affected the whole body for six hours. Only a general feebleness remained the next day. The second case did not develop pruritis until 18 hours after the injury, but this lasted for three days. An aphthous eruption of the lips and gums lasted a further four days. Hypercholesterinaemia and eosinophilia were present. The blood of this patient at the most intensely pruritic stage was infective for two rabbits.

Both cases recovered spontaneously with palliative treatment, and by that time the virus was no longer found in the blood.—C. V. WATKINS.

SCHLOTTHAUER, C. F. (1938). **Meningitis, Encephalitis and Myelitis in Dogs.**—*J. Amer. vet. med. Ass.* **92.** 619-636. 6 figs. [5 refs.]

Viruses and bacteria and their toxins are stated to be the chief causes of meningitis, encephalitis and myelitis in dogs. Among the conditions which are associated with nervous complications in animals, S. refers to dog distemper, various food (fat, vitamin and mineral) deficiencies, uraemia, and infestation with intestinal parasites and with ticks. He observed chronic encephalitis in dogs, occurring as a primary disease, but he was unable to find any definite organisms in the brain and spinal cord of such cases. For details of the symptoms in the above conditions the original may be consulted. Meningitis usually causes hyper-

aesthesia about the head and neck, and if the spinal meninges are affected there is marked pain over the back. Disturbances of consciousness and motor functions are the most common symptoms of disseminated encephalitis. Local encephalitis, manifested by chorea, is generally referable to definite portions of the brain. The most frequent symptoms noted in myelitis is paralysis of both hind legs.

The pathological findings in the nervous system are described. It is pointed out that in old cases of encephalitis following distemper, definite lesions cannot always be demonstrated. S. gives the histories of ten cases altogether of meningitis, encephalitis and myelitis to illustrate the various symptoms and lesions observed in these diseases in dogs. The paper is really a clinical study.—N. J. Scorgie.

I. Béclère, A. (1937). Influenza. Revue générale. I. L'influenza épidémique et l'épizootie porcine ou " hog flu ". [**Swine Influenza**].—*Pr. méd.* **45.** 73-76. [10 refs.]

II. Shope, R. E. (1938). **Serological Evidence for the Occurrence of Infection with Human Influenza Virus in Swine.**—*J. exp. Med.* **67.** 739-748. 2 tables. [18 refs.]

I. The relation of swine influenza to human influenza is reviewed in general terms, with special reference to the work of Shope. The particular points discussed are experimental transmission of swine influenza, the isolation and pathogenesis of *Haemophilus influenzae suis* and its association with a filtrable virus, and natural and acquired immunity. B. brings no fresh knowledge to the subject.

II. The susceptibility of swine to the virus of human influenza under experimental conditions has already been demonstrated by S. [*V. B.* **7.** 226]. In this article he reports that three herds of pigs were apparently affected with the virus of the human infection under field conditions. The animals had been fed on garbage from institutes in which influenza-like outbreaks had occurred among the human inmates during the winter period ; one of these epidemics had been studied in detail by other workers and a strain of human influenza virus had been isolated.

Neutralizing antibodies were found in the sera of several of the pigs many months after the human outbreak. The antibodies were detected by the inoculation of mice with mixtures of undiluted serum and infected mouse lung, and occurred only in the blood of the older pigs, born during the winter months. The sera failed to protect against swine influenza virus.

It is of interest that in one outbreak some of the sera blocked out the local strain of human influenza virus, but were not completely effective against the routine strain (P.R.8). It is suggested that this observation affords additional evidence of the existence of antigenically different strains of influenza virus.
—R. E. Glover.

I. Bridré, J., & Bardach, M. (1938). Essais de sérothérapie préventive antivaccinale. [**Control of Vaccinia with Antiserum**].—*Ann. Inst. Pasteur.* **60.** 270-276. 1 table. [5 refs.]

II. Cesari, E., & Boquet, P. (1938). Préparation d'un sérum antivaccinal avec le testiculo-vaccin. [**Preparation of an Antivaccinial Serum by the Use of Testicular Virus**].—*Ibid.* 277-284. 2 figs., 1 table. [Numerous refs.]

I. Hyperimmune sera prepared by the repeated subcutaneous injection of rabbits and horses with a highly active neuro-vaccine were tested for their protective value on rabbits, g. pigs and mice by the method of passive immunity. The rabbit sera were easily assayed and were reasonably active. The horse sera, however, were difficult to test, as they showed a high toxicity for the rabbit, while the response of normal g. pigs to the test dose of virus was so erratic that the

results could not be analysed. Satisfactory protection was obtained in mice, but the numbers used were small.

The action of these sera was mainly in the direction of limiting the effect of the virus ; they failed to prevent completely the appearance of lesions.

II. A hyperimmune serum was prepared by inoculating a horse (subcut.) with a strain of testicular vaccine. In order to obtain large amounts of infective material, rabbits were inoculated intraperitoneally with testicular emulsion, and the peritoneal fluid plus the omentum were used as inoculum.

The value of the sera was determined by mixing decreasing amounts with a fixed quantity of virulent pulp and applying the mixture to the skin of rabbits. After nine months the serum in a dose of 0·005 c.c. completely neutralized about 8 minimum infective doses of vaccine, while amounts as low as 0·00005 c.c. were partially effective.—R. E. Glover.

I. Blanc, G., & Martin, L. A. (1938). Réaction de l'âne au virus claveleux. [**The Reaction of Donkeys to Sheep Pox Virus**].—*C. R. Soc. Biol. Paris.* **127.** 1426-1427.

II. Blanc, G., & Martin, L. A. (1938). Action de la bile sur le virus anticlaveleux. [**The Action of Bile on Sheep Pox Virus**].—*Ibid.* **128.** 71-72. [1 ref.]

I. A local reaction, from which the virus was recovered, was induced in donkeys inoculated subcutaneously with sheep pox virus. Injected into the anterior chamber of the eye, the virus induced an iridocyclitis followed by a local immunity of short duration. The sera of donkeys receiving repeated doses of the virus once a fortnight for ten months showed neutralizing antibodies.

II. Bile exerted a modifying action on sheep pox virus. The mixture induced a local reaction comparable to that resulting from a properly balanced serum-virus suspension. The proportion of bile to virus recommended is 1 : 20 for a period of 48 hours, or 1 : 100 for five days.—R. E. Glover.

Blaizot, L. (1937). Ecthyma contagieux du mouton et de la chèvre. [**Contagious Ecthyma of Sheep and Goats**].—*Thesis, Alfort.* pp. 78. 11 figs., 1 table. [Numerous refs.]

B. gives a general review of contagious pustular dermatitis of the sheep and goat. Details of personal investigations are meagre, but the transmission of the virus to the rabbit and the donkey is reported. He advocates protective inoculation of animals in affected areas by the application of suspensions of dried virus to those parts of the skin where there is a minimum danger of secondary infection. —R. E. Glover.

Moses, A. (1937). Accão da saponina, sobre o virus do myxoma infectuoso dos coelhos. [**Action of Saponin on the Virus of Infectious Myxoma of Rabbits**]. —*Rev. Produc. anim., Rio de J.* **4.** 47-49. [6 refs.] [French summary].

The virus was still fully virulent for rabbits after being kept at room temperature for seven days in 2% saponin.

10% saponin acting for 10-30 days was usually lethal to the virus. Saponinized virus had no value as a vaccine.

After 32 days in a refrigerator the virus-saponin mixture [strength of saponin not given] was capable of causing localized lesions only, but full virulence was regained after three passages.—S. Torres.

Schlesinger, M., & Andrewes, C. H. (1937). **The Filtration and Centrifugation of the Viruses of Rabbit Fibroma and Rabbit Papilloma.**—*J. Hyg., Camb.* **37.** 521-526. 4 tables. [15 refs.]

Particle size of the virus was estimated by both the filtration and centrifugation methods in each case. Titration of the virulence of each virus was done, using rabbits, by intradermal inoculation or scarification. Preliminary clarification of the virus was made through asbestos pulp or paper pulp and sand. The former gave better clarification, but could not be used for fibroma virus, since it greatly reduced the virulence of the virus by adsorption. The particle size of the virus as estimated by indirect methods gave a particle size in the region of 125-175 $m\mu$. From data obtained by suspending and spinning the virus in solutions of saccharose of known specific gravity, the size of virus was calculated to be 126-141 $m\mu$, values which agree with those obtained by filtration. Results obtained by filtration of papilloma virus were more regular than those obtained by the filtration of fibroma virus. The particle size of the virus was calculated directly from these results, giving values of 23-35 $m\mu$. Centrifugation of the virus gave higher values than filtration, *i.e.*, 32-50 $m\mu$.—L. E. Hughes.

Besredka, A., & Gross, L. (1938). Du rôle de la peau dans le sarcome de la poule au point de vue de la réceptivité et de l'immunité. [**The Role of the Skin in Fowl Sarcoma with Reference to Susceptibility and Immunity**].—*Ann. Inst. Pasteur.* **60.** 465-476. [11 refs.]

The authors found considerable differences in the development of the fowl sarcoma, according to whether the fowl was infected by subcutaneous or intradermal inoculation.

It was found that subcutaneous sarcomata took longer to develop than the intradermal type. The subcutaneous tumours which did develop became rapidly larger and caused death. Intradermal sarcomata developed slowly, frequently showing arrested growth for months; when small doses of inoculum were used, the resulting tumours might be reabsorbed in a few cases.

Fowls which reabsorbed intradermal tumours became refractory to further inoculations of sarcomatous material, administered either intradermally or intramuscularly. Such immunity was lasting, solid and specific.

As it was not possible to immunize birds passively with sera from hyperimmune birds, the authors concluded that the resistance was of a cellular nature.—D. L. H.

Ask-Upmark, E. (1938). Ein gehäuftes (" epidemisches ") Vorkommen von Hühnertumoren. [**An Outbreak of Fowl Tumours**].—*Frankfurt. Z. Path.* **52.** 51-53. 1 fig. [1 ref.]

In a poultry flock of 100 hens about 25 died in the course of one year from ovarian carcinoma, the tumours being pale yellow and of great size. Metastasis was seen on the peritoneum and in the liver. Attempts at transmission failed. No details are given of any histological work.—Sassenhoff (Munich).

Sabin, A. B. (1938). **Progression of Nasally Instilled Viruses along Different Nervous Pathways in the Same Host.**—*Proc. Soc. exp. Biol., N.Y.* **38.** 270-275. 1 fig., 1 table. [Numerous refs.]

S. studied the routes taken by the neurotropic viruses of vesicular stomatitis, eastern equine encephalomyelitis and Aujeszky's disease. It was found that 15-day-old mice were much less susceptible to the virus of Aujeszky's disease than to those of the two former conditions.

Transverse serial sections were made of the entire skull, without the lower

jaw, with all the cranial nerves and autonomic ganglia, and representative regions of the spinal cord.

With vesicular stomatitis and eastern equine encephalomyelitis the lesions which permitted mapping of viral progression were those of neuronal necrosis, whereas with Aujeszky's disease virus the lesions were indicated by acidophilic intranuclear inclusion bodies in the path of the virus, with no necrosis.

The vesicular stomatitis and eastern equine encephalomyelitis viruses, as reported previously, followed the pathway of the olfactory nerve [*V. B.* **8.** 770]. Aujeszky's disease virus, on the other hand, followed the course of the fifth and seventh cranial nerves and the sympathetic. Evidence was obtained that these viruses did travel along the nerve routes and were not conveyed there by the blood, by demonstration of the fact that virus inoculated into the leg of a rabbit resulted in abundant virus in the blood with no lesions in the structures mentioned ; again, nasal instillation resulted in unilateral invasion by the virus in all cases observed, and the virus was not found in any nerves or ganglia having no connexion with the instilled mucous membrane.

S. concludes that the facility with which certain neurotropic viruses invade the C.N.S. after nasal instillation is dependent upon a special affinity between certain viruses and certain cells.—L. E. Hughes.

Burnet, F. M., Keogh, E. V., & Lush, Dora. (1937). **The Immunological Reactions of the Filterable Viruses.**—*Aust. J. exp. Biol. med. Sci.* **15.** 231-368. 27 figs., 18 tables. [Numerous refs.] [Supplement obtainable in monograph form, University of Adelaide. (10s.)].

This excellent production is a review of the reactions between viruses (including plant viruses and bacteriophages) and their homologous antisera ; it was primarily inspired by the results of the work of the authors on those viruses which produce discrete pocks on the chorio-allantoic membrane of the developing egg. The section on plant viruses is wholly a compilation from the literature. The experimental work and the discussion of results are full of interest, especially for those particularly concerned with the theory of immunity and antigen-antibody reactions. The developing egg technique is specially suited for the study of the virus-neutralization reaction, and accurate results can be obtained without the necessity of using a large number of experimental animals. The viruses used by the authors were those of vaccinia, influenza, louping ill, Rift Valley fever, equine encephalomyelitis, Newcastle disease, infectious laryngotracheitis of fowls, and myxomatosis of rabbits.—T. S. Gregory.

Glaser, R. W. (1938). **Test of a Theory of the Origin of Bacteriophage.**—*Amer. J. Hyg.* **27.** 311-315. 2 tables. [5 refs.]

G. designed experiments to test a theory that bacteriophage is produced as a result of an interaction of the host and a susceptible bacterium. For this purpose the common house-fly was reared under aseptic conditions ; it was repeatedly shown through many generations that the experimental flies were free from both bacteria and 'phage. Flies caught in nature or bred in the contaminated state invariably contained 'phage.

The establishment in the alimentary tract of sterile house-flies of a non-lysogenic staphylococcus known to be susceptible to lysis did not lead to the establishment of 'phage. In the absence of this micro-organism, 'phage, when given to sterile flies, survived for one generation, whereas in the presence of the bacterium it persisted for eight generations, when the experiment was concluded.

The theory is considered not proved nor disproved.—L. E. Hughes.

## PARASITES IN RELATION TO DISEASE [GENERAL]

DE JESUS, Z. (1938). **External and Internal Metazoan Parasites of Philippine Cattle.**—*Philipp. J. anim. Indust.* **5.** 21-34. 1 table. [Numerous refs.]

A study was made of the relative percentage infestation with external and internal parasites of carcasses of cattle used for the manufacture of rinderpest vaccine. The cattle ranged from three to five years in age and came from certain stated provinces. A table showing the percentage infestation is given, followed by a few notes on each parasite. *Boophilus australis* was found on 95% of the cattle: this tick, together with *Fasciola hepatica*, *F. gigantica*, *Oesophagostomum radiatum* and *Haemonchus contortus*, are found throughout the Philippines. Cases of heavy infestations with *H.c.* met with in both young and old cattle and water buffaloes showed that young cattle were severely affected and that water buffaloes tolerated the infestation. Mixed infections of *F.h.* and *F.g.* were encountered.—R. FISHER.

## PARASITES IN RELATION TO DISEASE [ARTHROPODS]

SACCHI, R. (1937). Gli ectoparassiti dei polli. **[The Ectoparasites of Fowls].** —*Note Appunti sper. Ent. agrar.* **3.** 43-73. 18 figs. [Numerous refs.] [Copied *verbatim* from *Rev. appl. Ent.* **26.** 61].

Descriptions are given of the species of Mallophaga, mites and ticks that infest fowls, with general notes on their bionomics and control.

JACKSON, C. H. N. (1936). **Some New Methods in the Study of** *Glossina morsitans*. —*Proc. zool. Soc. Lond.* Part 4. pp. 811-896. 9 figs., 12 plates, 30 tables. [Numerous refs.]

Field studies of *Gl.m.* in typical tsetse country, at Kakoma, Tanganyika Territory, were undertaken to test the value of results obtained previously in other districts, and to meet certain criticisms of the validity of previous conclusions. J. shows that the hunger stage of flies can be assessed by visual examination of the gut in the field, and shows by this means that hungry flies search for game, and tend to concentrate in recognized feeding grounds.

The reliability of a method of estimating the total fly population [see *V. B.* **8.** 226.] is discussed, and some studies on fly numbers by this method are recorded.

Field observations on the choice of breeding sites, the influence of vegetation on seasonal distribution and activity of flies, and the relation of population density to evaporation rate, are given in detail.—J. MACLEOD.

SIMMONS, S. W. (1937). **Some Histopathological Changes Caused by** *Hypoderma* **Larvae in the Esophagus of Cattle.**—*J. Parasit.* **23.** 376-381. 6 figs. [6 refs.]

The following is the author's summary: Some of the principal histopathological reactions resulting from the invasion of the oesophageal tissue of cattle by *Hypoderma lineatum*, Vill., are described and illustrated. Typically the larvae occur in the submucosa and cause inflammatory oedema. The oedema produced about the larvae distorts the submucous connective tissue and occasionally invades the muscularis mucosa. The infiltration of leucocytes into the pathological area is striking. Most of the haemocytes are eosinophils, lymphocytes, and plasmocytes. In some cases, many of the eosinophils present were myelocytes. Eosinophils may be present at an average density of 476,365 cells per cubic millimetre of tissue. The healing of a larval channel is described and illustrated.

Cottral, G. E. (1938). **Buffalo Gnats in the Ears of Horses.**—*Vet. Med.* **33.** 376-377. [8 refs.]

A number of cases of infestation of the ears of horses with *Simulium vittatium* are recorded. Although the flies were present in considerable numbers, there were no dangerous sequelae. Local treatment with camphor-phenol afforded considerable protection from further attacks. A summary of the pathogenicity of the fly as expressed by various authors is appended. It is said that as there is some doubt, the pathogenetic aspect of the condition merits further research. [Deaths in cattle and horses due to attacks by midges are well known in Europe].

—D. D. Ogilvie.

Oswald, B. (1938). Lésions externes observées chez des tiques conservées au laboratoire. **[External Lesions in Ticks Kept in a Laboratory].**—*Ann. Parasit. hum. comp.* **16.** 151-152. 6 figs. on 1 plate. [1 ref.]

O. describes a mycelial growth which affected some individual ticks of *Boophilus annulatus calcaratus* stored in Petri dishes under moist conditions in his laboratory at Skoplje, Jugoslavia. The engorged females which were attacked usually died, presumably from occlusion of the spiracles.

An affection of the cuticle of engorged female *Hyalomma aegyptium*, resembling in appearance eczema of mammals, and the occurrence of circular patches of desiccation on the cuticle of *B. annulatus calcaratus* and *Ixodes ricinus*, are briefly described.—J. MacLeod.

## PARASITES IN RELATION TO DISEASE [HELMINTHS]

Taylor, E. L. (1938). **The Logical Approach of Veterinary Parasitology to Obscure Disease Problems. [Correspondence].**—*Vet. Rec.* **50.** 434-436. [4 refs.]

A general discussion of present research methods in parasitology, stressing the need for a more critical attitude to the apparent disease relationships of parasitic worms, particularly in poultry, and emphasizing the danger of assuming a causal relationship between observed heavy infestation and disease. T. suggests that the proper approach to the study of veterinary parasitology is from the individual disease to the cause, rather than from the parasites to possible resulting disease, as otherwise there is a danger of wasteful expenditure of resources on aspects which may turn out to be unimportant.

The report of the Poultry Technical Committee [*V. B.* **8.** 395.] is instanced to show how lack of precise information of the relationship of parasitism to disease has resulted in widely divergent diagnoses of the main causes of poultry mortality being given by different centres.—J. MacLeod.

Arenas Martorell, R., Pereira Pérez, R., & Wahlember, A. (1937). Afecciones parasitaris del tejido muscular en nuestros animales de matadero. (Bovinos, ovinos, caprinos y porcinos). **[Trichinella and Cysticerci in the Muscular Tissue in Cattle, Sheep, Goats and Pigs].**—*Rev. Med. trop. parasit., Habana.* **3.** 43-45. [Copied *verbatim* from *Helminth. Abstr.* **6.** 61-62. Signed B. G. P.]

Arenas Martorell and his collaborators contribute brief notes on Trichinella, *Cysticercus bovis* and *C. cellulosae*. Trichinella probably occurs in Cuba, but is not systematically looked for. *C. bovis* is present in over 3 % of Cuban cattle, while *C. cellulosae* is rare.

GRIEDER, H. (1937). Seltene Nutriaparasiten. [**Rare Parasites of Nutria**].—*Schweiz. Arch. Tierheilk.* **79.** 520-525. 4 figs. [4 refs.]

G. observed the following rare parasites in nutria :– *Fasciola hepatica* twice (in one case it was the cause of death) ; *Stichorchis waltheri n.sp.* once in the caecum of a nutria imported from Argentina ; *Echinococcus granulosus* once and *Filaria kitti n.sp.* in a number of cases.—SASSENHOFF (MUNICH).

OLDHAM, J. N. (1938). **Internal Parasites of Pigs.**—*Vet. Rec.* **50.** 679-685. [12 refs.]

A short summary is given of the internal parasites of pigs, with brief indications of their economic importance. A catalogue of British species is included, and their life-histories and pathogenicity are traced. A number of foreign species are also mentioned.

The overwhelming importance of *Ascaris lumbricoides* relative to all other species in Great Britain is emphasized, and it is dealt with in some detail.

General indications of control and treatment are appended.—D. D. OGILVIE.

CLAPHAM, Phyllis A. (1938). **The Relation of Helminthiasis to Leukaemia in Domestic Fowls.**—*J. Helminth.* **16.** 53-56. [3 refs.]

On P.M. examination of 50 fowls, many of which were affected with leucaemia, a correlation was found between the degree and stage of parasitic infestation and the presence of leucaemia.

The series comprised normal birds slaughtered for food, birds which had died from causes other than leucaemia, and leucaemic birds. The two latter classes carried a heavier helminth infestation than did the normal birds. Among the parasites found were *Heterakis gallinae*, *Capillaria longicollis*, and *Ascaridia lineata*. Although the worm burden in the leucaemic birds was heavy, the majority of the worms were very young adults and immature forms.

C. suggests that there is considerable circumstantial evidence that the presence of leucaemia virus may predispose the host to helminth infestation. As leucaemia takes 6-8 weeks to run its course, and the young forms of *Heterakis* and *Ascaridia* found in this case were about three weeks old, it appears that the increased infestation may well have been associated with a lowered resistance to helminths following infection with leucaemia virus.—D. L. HUGHES.

ROBERTSON, D. (1937). **Lungworms in Pigs.**—*Scot. J. Agric.* **20.** 373-377. 6 plates, 1 table. [1 ref.]

R. examined 1,009 apparently healthy bacon pigs 6½ to 7 months old from seven counties in north-east Scotland, most of them coming from Aberdeenshire. He tabulates the incidence of lungworms found, the average infestation being 11 worms, and the maximum 65.

R. determined that infective larvae from injured earthworms may survive for two weeks and that these hosts may harbour up to four thousand larvae.—C. V. W.

CURLEY, E. M., & HERRING, F. G. (1938). **The Conquest of Strongyloidiasis.**—*Vet. Bull. U.S. Army.* **32.** 197-206. 3 charts.

The authors describe highly successful results which attended their treatment of strongyloidiasis in cavalry horses in the U.S.A.

The degree of infection was first ascertained by the sugar-flotation method. After fasting for 24-36 hours, the horses were given, by stomach tube, 10 c.c. of oil of chenopodium in liquid petrolatum and linseed oil. Purging occurred in

18-24 hours. Following the treatment, a bran mash was given, but hay was restricted in quantity, and no grain was allowed for four days.

Egg counts were retaken two to six weeks after treatment and according to this test the treatment was 90% efficient. In horses over 1,200 lb. weight, however, 16 c.c. doses of chenopodium were necessary to give comparable results.—D. D. O.

I. Grieder, H. (1937). Strongyloidesseuche in zwei Nutriafarmen. [**Strongyloides Outbreaks in Two Nutria Farms**].—*Schweiz. Arch. Tierheilk.* **79.** 475-480. 2 figs. [5 refs.]

II. Enigk, K. (1938). Zur Biologie des Strongyloides aus dem Sumpfbiber. [**Biology of Strongyloides from the Nutria**].—*Dtsch. Pelztierz.* **13.** 2-5. 1 fig., 1 table. [8 refs.]

I. A heavy strongyloides infestation of nutria was found in two farms; in the young animals coccidiosis was also present. Attempts to expel or kill the worms with an extract of *Allium sativum* or by the feeding of garlic were unsuccessful. The animals gradually recovered from the ill-effects of the worm infestation, and G. suggests that this was partly due to the garlic, which he considers to have an anodyne action on the intestine.

II. *Strongyloides myopotami* is a specific parasite of nutria. It is a minute, hair-like roundworm 5-6 mm. long. The eggs are produced in the intestine of the host and are passed out to give rise to larvae which develop during about 2½ days in water or on wet ground; they quickly perish on dry ground. The infective larvae reach the host from the ground and bore their way through the skin, passing by way of the lymph channels to the right side of the heart and thence to the lungs. If they reach the bronchi they are coughed up and swallowed. This process takes 15-20 days from the time the larva infects the host. For control purposes it is necessary to clean out the cage and swimming pond every second day.

—Sassenhoff (Munich).

I. Rubli, H. (1936). Trichinose beim Sumpfbiber, Myocastor coypus Mol. [**Trichinosis of the Nutria**].—*Schweiz. Arch. Tierheilk.* **78.** 420-424. [7 refs.]

II. Schoop, G. (1937). Trichinenschau bei Pelztieren. [**Trichina Inspection in Fur Animals**].—*Dtsch. Pelztierz.* **12.** 270-272. 1 fig.

I. Trichinosis was found in five people who had consumed nutria flesh. A trichina inspection was carried out on other fur animals on the same farm, and trichina were found in the muscles of three nutria, one mink and two rats. In the nutria the muscles of the throat, neck and chest regions were most severely infected. In all cases the infections were fresh ones.

II. In recent years in Germany cases of human trichinosis following the eating of game and fur animals have been observed. In future all carnivorous fur animals, and other animals which may possibly be carriers of trichinosis and may ultimately be used for human consumption, must be examined for trichina.

—Sassenhoff (Munich).

## IMMUNITY

Boquet, P. (1937). Sur la sensibilité allergique des animaux pseudo-tuberculeux. [**Allergic Sensitivity of Animals Infected with** *Pasteurella pseudotuberculosis*]. —*C. R. Soc. Biol. Paris.* **125.** 411-412. [3 refs.]

B. describes experiments carried out to determine whether g. pigs infected

with *Past. pseudotuberculosis* would give an allergic reaction to an intradermal injection of the organism. He concludes from the results that the diagnostic value of the test is questionable, since a high proportion of controls free from pseudotuberculous lesions also gave a positive reaction.

KALINNIKOV, V. G. (1937). Diagnostika kroničeskih form sapa. [**Diagnosis of Chronic Forms of Glanders**].—*Sborn. Rab. Leningrad. vet. Inst. 1937.* pp. 117-126. 3 tables. [12 refs.] [German summary].

K. compared the ophthalmic [sic] and subcutaneous mallein tests on two lots of horses from infected districts and states that he found that the subcutaneous test was more reliable for this purpose. [No verification of the test results by P.M. examination was carried out].

DEAN, H. R. (1937). **The Reaction of Isamine Blue with Serum.**—*J. Path. Bact.* **45.** 745-771. 6 tables. [6 refs.]

D. has found that in optimal proportions the dye isamine blue is precipitated from solution when mixed with serum. The constituent of the serum responsible for the precipitation of the dye may be globulin. When precipitation occurs in optimal proportions of dye and serum, the former falls to the bottom as a blue deposit, leaving a water-clear supernatant. The appearance of the floccules suggests that the dye particles are agglutinated by the serum.

This reaction may be of use in the quantitative estimation of the reacting substance, probably globulin, in certain body fluids.

The addition of this dye to a mixture of horse-serum and anti-horse-serum in optimal proportions results in precipitation of the dye. The dye can thus be used as an indicator of the specific reaction of antigen and antibody, in a similar manner to a haemolytic system.—D. L. HUGHES.

HETTCHE. (1937). Die Einwirkung enteraler und parenteraler Infektionen und Intoxikation auf den Dünndarm. [**The Action of Enteral and Parenteral Infection and Intoxication on the Small Intestine**].—*Zlb. Bakt. I.* (*Orig.*). **140.** 74-76. 1 fig., 1 table.

A method is described of testing the effect of bacteria or their toxins on the isolated living intestine, by subcutaneous or enteral injection. Botulinus toxin has no effect, nor has diphtheria toxin when injected enterally, but when injected subcutaneously it inhibits the action of the intestines. Diphtheria and Breslau bacilli have a similar but less marked action.—P. S. WATTS.

NÉLIS, P. (1938). Sur les rapports existant entre les anticorps humoraux et les anticorps du liquide céphalo-rachidien. [**Connexion between Humoral Antibodies and the Antibodies of the Cerebrospinal Fluid**].—*Rev. Immunol.* **4.** 53-64. 2 tables. [12 refs.]

Nine rabbits were injected intraspinally and seven subcutaneously with T.A.B. vaccine. The agglutinating titre of the serum and cerebrospinal fluid of each rabbit was tested after 30 days. While all the sera were strongly positive, the cerebrospinal fluids were negative. The serum and cerebrospinal fluid of nine survivors from 24 rabbits, injected intravenously with live paratyphoid bacilli, were tested after a month. The average titre of the sera was 1 : 20,000 and of the cerebrospinal fluid 1 : 40. A third experiment in which three rabbits were injected intraspinally with anastaphylotoxin confirmed N's opinion that the cerebrospinal antibodies were of humoral origin. Intraspinal injection of four rabbits with broth was found to increase the passage of humoral antibodies into the cerebrospinal fluid.—R. O. MUIR.

HEIDELBERGER, M. (1938). Les aspects chimiques de la fonction antigène et leurs rapports avec les agents infectieux. [**Chemical Aspects of Antigenic Action and their Connexion with Infective Agents**].—*Rev. Immunol.* **4.** 293-303. 2 figs., 2 tables. [Numerous refs.]

This article consists of a general review of present-day knowledge of the chemistry of antigens. The fundamental researches on the alteration of the specificity of various antigens by nitration and halogenation, by methylation, esterification and acetylation of proteins, and the building up of synthetic antigens by means of the di-azo reaction are discussed. The antigenic structure of various groups of bacteria is surveyed from the chemical aspect. The following groups of micro-organisms are considered :– pneumococci, haemolytic streptococci, the varieties of the tubercle bacillus, the salmonella, the bacillus group, the brucella, and the vibrios.

The article should be read in the original by all who need a concise and adequate summary of the advances gained in this aspect of immunity.—D. L. H.

## DISEASES, GENERAL

DATTA, S. C. A. (1938). **Animal Diseases in Relation to the Economy of Man in India.**—*Agric. Live-Stk India.* **8.** 123-140. 38 figs. on 3 plates, 1 table.

This is a popular article in which animal diseases are discussed from the aspect of national health and wealth with special reference to India. A useful table is given showing the diseases of animals communicable to man and their mode of transmission.—N. J. SCORGIE.

MULLEN, A. L. (1937). **Report upon a Two-Year Survey of Wastage Due to Disease in a Number of Lancashire Milk Recorded Herds.**—*Yearb. Lancs. Milk rec. Soc. 1937.* pp. 26-36. 5 tables.

A survey of 35 farms (records only received from 21) containing 1,400 cattle yielded some interesting figures. 40·7% of the total disposals were due to actual disease. Of these, sterility accounted for 11·5%, mastitis for 9·2%, contagious abortion for 8·0% and tuberculosis for 5·7%. Other diseases seldom exceeded 2% of the total. In addition, 25·3% were disposed of owing to abnormalities and defects and 33·9% for reasons quite apart from disease and defects. Mastitis was found on most of the farms visited, and the great majority of the cases were of the insidious streptococcal type. Losses from Johne's disease were low and almost exclusively associated with ground water supplies. Reference is made to the significance of tuberculosis and this is along orthodox lines. Losses from contagious abortion appear low, but these figures only represent actual wastage and not abortion infection or sterility losses resulting therefrom. Sterility was the greatest source of wastage, and with contagious abortion it is jointly responsible for most of the difficulty in self maintainance.

M. suggests there is room for a general all-round improvement in cattle farming and recommends the utilization of modern scientific methods for the attack on animal diseases. He deplores the faith placed in patent medicines and urges a greater appreciation of the veterinarian's services.—R. FISHER.

MOUTAUX. (1938). Notes cliniques de pathologie bovine. [**Clinical Notes on Bovine Pathology**].—*Rec. Méd. vét.* **114.** 326-329.

Short notes are given on the following conditions :– the accumulation of pus in the region of the croup, buttock or thigh following foot and mouth disease ;

vomiting in a cow during pregnancy ; the occurrence of lateral flexion of the neck in bovines just before death ; diffuse haematoma of the inferior cervical region in a calf, attributed to haemorrhage from the thymus ; bovine lymphangitis ; abscesses of the abdominal wall in cattle, due to foreign bodies ; perforation of the rectum in a pregnant cow without any accompanying lesion in the uterus ; colic in the early stages of bovine pyelonephritis.—Gwilym O. Davies.

Rowlands, W. T. (1938). **Some Local Sheep Disease Problems.**—*Vet. Rec.* **50.** 604-610.

R. gives a short description suggesting also lines of treatment of each of the common diseases of sheep in North Wales, *viz*, enterotoxaemia, braxy, lamb dysentery, " struck " [anaerobic infection], infectious pneumonia, pregnancy toxaemia, liver fluke infestation and parasitic gastro-enteritis.—P. S. Watts.

Curasson, G. (1938). Maladies du mouton dans les colonies. **[Sheep Diseases in the French Colonies].**—*Rec. Méd. vét. exot.* **11.** 5-22. [1 ref.]

C. notes that the diseases in the French colonies differ from those in France owing to climatic conditions, the multiplicity of breeds of sheep, and the presence of different exciting agents. Of virus diseases he notes the distribution of blue-tongue, Nairobi disease, Rift Valley fever, sheep pox and contagious pustular stomatitis. In the case of bacterial diseases, anthrax, blackleg and pasteurellosis are noted. Heartwater is discussed. Parasitic gastro-enteritis and mange are important. Trypanosomiasis and piroplasmosis are said not to cause great loss in sheep. Mineral and vitamin deficiency diseases are also common, while losses are caused by the direct heat of the sun and by plant poisoning. Of diseases on which more research is required, enterotoxaemia, in Annam, and pleuro-pneumonia, in Africa, are mentioned. Finally the relative importance of the various diseases in each colony is given.—P. S. Watts.

Köbe, K. (1938). Gehäufte Erkrankungen bei Wildschweinen eines Sauparks. **[Diseases of Wild Pigs in Parks].**—*Berl. tierärztl. Wschr.* April 8th. 199-201. 1 table. [7 refs.]

The detailed results of the examination of the organs of nine wild pigs are given under the headings of pathological anatomy, bacteriology and animal inoculation. Five were heavily infested with lungworms and two others died from swine influenza. The cause of death in the two remaining was not decided. In every case swine fever was excluded by the inoculation of normal pigs. K. discusses the question whether S.F. occurs among wild pigs [see *V. B.* **8.** 703.], and concludes that it does not.—P. S. Watts.

Watkins, C. V. (1938). **Some Diseases of Silver Foxes.**—*Vet. Rec.* **50.** 481-489.

This paper is concerned mainly with parasitic infestations of foxes. Among the ectoparasites of the ear, the mange mite (*Otodectes cynotis*) is important. Infestation with this parasite may be heavy, and is usually associated with loss of condition and, occasionally, fits. Demodectic mange mites (*Demodex canis*) and fleas (*Ctenocephalides canis*) may also be troublesome.

Broncho-pneumonia caused by lungworms (*Crenosoma vulpis* and *Capillaria aerophilia*) is a common cause of death. *Cr.v.* passes its intermediate stage in various snails, and preventive measures should be aimed at the elimination of these vectors. Ascarid worms, hookworms and tape worms also cause losses.

The following diseases are also dealt with in the paper :– " paratyphoid disease " caused by *Salmonella enteritidis* (*dublin*), leptospiral jaundice, and

encephalitis. In the discussion following the paper, hygienic measures for the control of parasitic infestation constituted the chief topic.—D. L. Hughes.

—. (1938). **Report of the Committee on Transmissible Diseases of Poultry [U.S. Live Stock Sanit. Ass.].**—*J. Amer. vet. med. Ass.* **92.** 425-429.

Recommendations are made in this report concerning the field control of pullorum disease, on certain respiratory and nutritional disorders, and on the lines along which the problem of adult mortality can be investigated. Besides discussing recent technical developments, the report reviews several diseases with a view to emphasizing the necessity of the closest co-operation between the farmer, the field advisors and the veterinary laboratory.—Geoffrey B. Brook.

Hinshaw, W. R. (1938). **Diseases of Turkeys.**—*Bull. Calif. agric. Exp. Sta.* No. 613. pp. 112. 56 figs.

This publication covers a very comprehensive list of diseases that may affect turkeys. It is well illustrated and should be of great value to all interested in the subject. The original should be consulted for details.—W. J. Ironside.

Schäper, W., & Weischer, F. (1938). Entstehung und Bekämpfung des Hufkrebses im Lichte der Konstitutionsforschung. **[Canker of the Hoof in the Light of Research on Constitution].**—*Tierärztl. Rdsch.* **44.** 216-222 and 234-238. [Numerous refs.]

The aetiology of hoof canker is not known; it consists essentially in a parakeratosis. About 20% of cases were found by Westhues [*V. B.* **8.** 718.] to respond to treatment with pressure bandages alone. The annual loss from the disease in Germany has been estimated at 5·75 million reichmarks.

Evidence is given which suggests a definite influence of heredity on the incidence of canker, so that various exogenous causes—moisture, irritation due to foul stall conditions, etc.—acting on a basis of hereditary predisposition produce the disease. The breeding history of certain stallions is cited in support of this view.

It is recommended that all stallions and mares which have at any time shown evidence of hoof canker should be debarred from use in breeding. This procedure, together with improved hygienic conditions, is said to afford the only hope of eradication of the disease.—E. G. White.

Tagliavini, A. (1938). Ueber die rezidivierende Uveitis des Pferdes. **[Periodic Ophthalmia in the Horse].**—*Arch. wiss. prakt. Tierheilk.* **73.** 66-70. [7 refs.]

Examination of 50 horses with periodic ophthalmia did not reveal the presence of any pathogenic organism, but in every case the thyroid glands were abnormal. The weight of the glands varied between 18 and 39 g., the follicular epithelium was flattened, and the follicles were filled with a compact colloid material containing numerous, pigmented, cornified flakes. This suggested that the animals were affected with a thyroid deficiency. Thyroid treatment was given to 38 horses showing the acute form of the disease, and in 36 of these animals no signs of the disease were present a year later. It is concluded that periodic ophthalmia is primarily a constitutional disease which does not appear unless there is a disturbance of thyroid function.—J. A. Nicholson.

Nikolskii, M. (1937). K voprosy geografičeskogo rasproskranenja ikterogemoglobinurii krupnogo rogatogo skota. **[The Geographical Distribution of Icterohaemoglobinuria of Cattle].**—*Sovyet. Vet.* No. 5. pp. 38-39.

Occurring in the Lower Volga, this disease attacks calves from two weeks to

eight months old. The symptoms are blood in the urine and high temperature, and sometimes conjunctivitis and diarrhoea; it is similar to the Ukranian form recorded, but differs from that of Northern Caucasia [*V. B.* **6.** 882, and **7.** 419]. P.M. examination reveals yellowing of the mucous membrane and subcutis. No blood parasites or spirochaetes were demonstrable by bacteriological methods, and the possibility of piroplasmosis was excluded by tests. A mild diet with frequent variation, daily attention, and segregation, are said to be the best control measures, but the disease spreads rapidly, with a high mortality. [Little information is given].

Butozan, V. (1938). Raširenost hroničke hematurije goveda u Jugoslaviji. [**Chronic Bovine Haematuria in Yugoslavia**].—*Vet. Arhiv.* **8.** 96-100. [Abst. from German summary]. [See also *V. B.* **8.** 597].

A statistical note on the geographical incidence of C.B.H. in Yugoslavia. It is commonest in Bosnia, but occurs in all provinces; it is chiefly prevalent in hilly wooded districts, and has been seen in 27·5% of all the government districts of the country.

I. Johnen, F. J. (1938). Die Durchführung der planmässigen Unfruchtbarkeitsbekämpfung bei Stuten. [**The Campaign against Sterility in Mares**]. —*Dtsch. Tierärztebl.* **5.** 189-191.

II. Karsten. (1938). Ueber die Organisation der planmässigen Bekämpfung der Unfruchtbarkeit der Stuten. [**The Campaign against Sterility in Mares**]. —*Ibid.* 191-193.

III. Krampe. (1938). Das obligatorische Sterilitätsbekämpfungsverfahren bei Stuten. [**The Obligatory Campaign against Sterility in Mares**].—*Ibid.* 193-195.

I. When a campaign is carried out it must by law apply to a complete breeding area and be carried out by practising veterinary surgeons under the direction of an organizer. All mares and stallions must be examined before being passed for breeding in order to prevent spread of infection and to improve the stock by elimination of those unfit. Stallions should not be overfed and must be given sufficient physical exercise. The service season should be extended and clinical diagnosis of pregnancy should be a routine procedure.

II. Recommendations are given regarding the care of stallions; the practice of many owners to allow their stallions to serve too many mares during the breeding season is condemned. The causes of sterility in mares are classified.

III. The use of clinical and especially of biological methods of diagnosis of pregnancy are discussed in relation to a compulsory campaign against sterility in mares.—A. T. Phillipson.

Orr, W. (1938). **Observations on Contagious Granular Vaginitis in Southern Rhodesia.**—*Vet. J.* **94.** 184-199. [Numerous refs.]

In the course of this work, which deals with the subject in considerable detail, many of the older conceptions of the disease are refuted. While the exact aetiology of the condition is still obscure, two things seem certain—the disease is not of a serious nature and, moreover, it is of little or no moment as a cause of sterility. In addition, it does not appear to be related in any way to contagious abortion, although some workers have sought to prove such a relationship.

Calves are most severely affected; in adults the disease is generally benign. The importance of the bull in transmitting the disease to adults has been greatly exaggerated. O. considers that the condition may be infective and that infection

may be *via* the alimentary route. Medical treatment of the condition is only justified on rare occasions, and even then great care must be exercised, or dangerous sequelae may result.—D. D. Ogilvie.

Velu, H. (1938). Silicose pulmonaire et dunes de sable. [**Pulmonary Silicosis in Sheep Caused by Sand**].—*C. R. Soc. Biol. Paris.* **128.** 13-14. 1 table. [1 ref.]

A short note on the occurrence of pulmonary silicosis in Moroccan sheep. A chemical analysis of the lungs of sheep obtained from the abattoirs of Casablanca showed that lungs of adult sheep from the desert regions contained a high proportion of silica as compared with those of lambs from the same regions or of adult sheep from outside the desert areas.—N. J. Scorgie.

I. Prein, W. (1937). Stipafrüchte in der Haut eines Schafes. [**Grass Seeds (*Stipa sp.*) in the Skin of a Sheep**].—*Dtsch. tierärztl. Wschr.* **45.** 829-830.

II. László, F. (1937). Durch Stipa capillata verursachte pathologische Veränderungen. [**Skin Changes Caused by** *St. capillata*].—*Ibid.* 830-831.

III. Overbeck, F. (1937). Die Früchte von Stipa (Pfriemengras) als Bohrkletten. [**The Penetrative Powers of the Fruits of** *Stipa*].—*Ibid.* 831-832. 3 figs. [4 refs.]

I. Approximately 60 seeds of *St. orientalis* were found embedded in the adipose tissue and musculature in the umbilical region of a sheep slaughtered at Isfahan, Iran; there was no evidence of any tissue reaction on macroscopic examination. The seeds, which are torpedo-shaped and very hard, are 6-12 mm. long and 0·5 mm. wide.

II. Penetration of the seeds of *Stipa sp.* into the skin and superficial muscles of sheep is recorded in Hungary, the seeds being embedded in a capsule of connective tissue. The condition was common in sheep in the agricultural conditions prevailing in Hungary during the 19th century, but records of its occurrence during recent years are rare.

III. The structure of the seeds of *Stipa sp.* is described with illustrations. The penetrative powers of the seeds are said to have caused serious losses in sheep in parts of Morocco, Australia, Argentina and Uruguay. Various parts of the alimentary tract may be penetrated and, in cases in Australia [referred to in Ullrich (1928). "Biologie der Früchte und Samen"], the seeds have been known to reach the heart musculature. Animals other than sheep are occasionally affected.—E. G. White.

McIlwaine, J. E. (1938). **Facial Eczema in Sheep. Possibility of a Recurrence of the Disease.**—*N. Z. J. Agric.* **56.** 97-98. 2 figs.

The 1935 outbreak of facial eczema is described in order to warn farmers against a possible recurrence of the disease. The essential cause of the condition is considered to be a sudden change of diet, as in the outbreak instanced, where rain brought a heavy flush of grass after a long drought. The disease can be prevented by supplying green feed during drought and, conversely, dry feed during flush periods.—D. D. Ogilvie.

Bradshaw, M. W. (1938). **Sunburned Calf.**—*Vet. Med.* **33.** 275. 1 fig.

In a herd of Holstein cattle in California, exposed to the direct rays of the sun, the white parts of the skin became affected due to photosensitization. The initial sensitization in this instance was ascribed to the ingestion of burr-clover.—D. D. O.

MINTSCHEFF, P. (1938). Ueber die Lähmung und Unterbrechung der Sympathicusinnervation der Augengegend bei den Haustieren. [**Loss of Nerve Supply to the Orbital Region in Domestic Animals**].—*Arch. wiss. prakt. Tierheilk.* **73.** 40-53. 4 figs., 1 table. [12 refs.]

In cats, section of the cervical sympathetic nerve was followed by a marked myosis and moderate persistent ptosis on the same side. In addition, the membrana nictitans was protruded across the eye, which became retracted, there was a secretion from the lachrymal gland and the lower lid was slightly raised. Vasomotor effects were also produced. Section of both the sympathetic and vagus produced a moderate myosis and ptosis, with slight protrusion of the membrana nictitans, whereas division of the vagus alone caused marked myosis and closure of the eyelids, which passed off after 24 hours.

Dogs behaved similarly to cats, but in horses and cattle section of the cervical sympathetic was followed by dilatation of the pupil and closure of the upper eyelid, as in sleep. Opacity of the cornea set in some days after the operation. Section of the vagosympathetic trunk produced the same effects. The difference between the effects of section of the sympathetic nerve in carnivora and herbivora is due to the fact that in the former the main sympathetic supply of the eye runs directly from the cervical sympathetic, whilst in the latter the main sympathetic supply comes directly from the hypothalamus. In conclusion, the clinical applications of these findings are discussed.—J. A. NICHOLSON.

DOYLE, L. P., & BULLARD, J. F. (1938). **Difficult Swallowing in a Horse.**—*J. Amer. vet. med. Ass.* **92.** 564-566. 2 figs.

A five-year-old horse showing uncomplicated symptoms of dysphagia was slaughtered. No gross lesions were apparent on autopsy, but microscopic changes were discovered in the petrous ganglion of the glossopharyngeal nerve. These consisted chiefly of degeneration of the ganglion cells and a well-marked infiltration with round cells. It is suggested, therefore, that the condition was of infective rather than toxic origin.—D. D. OGILVIE.

SUTHERLAND, G. F., & CURTIS, Q. F. (1938). **Myotonia Congenita in the Goat.**—*Proc. Soc. exp. Biol., N.Y.* **38.** 460.

Investigations with faradic current on the muscles of so-called " stiff-legged " goats showed that the condition thought to be a general tonic spasm was a failure of individual muscles to relax normally after stimulation. Repeated stimulation shortens the relaxation period till it approaches normal. The anomaly is hereditary.
—D. D. OGILVIE.

LÁSZLÓ, F. (1938). Ueber die Muskelhypoplasie des Schweines. [**Muscular Hypoplasia in Swine**].—*Dtsch. tierärztl. Wschr.* **46.** 369-371.

Two cases of fatty degeneration of the muscles of pigs are recorded. In both cases the degeneration was complete and histological examination showed that the contractile part of the muscle fibres had become converted completely or partially into adipose tissue. The sarcolemma was present and the connective tissue was normal.

It is suggested that the causes of the degeneration originated during embryonic life and might be referred to faulty development of the blood supply through pressure or some other cause which interfered with the normal metabolism of the developing muscle. This would give rise to transitional tissue which is more likely to develop into adipose tissue than normal muscle. The muscles generally affected in pigs are those of the back.—T. A. NICHOLSON.

HADWEN, S. (1937). **The Melanomata.**—*J. comp. Path.* **50.** 293-296. 9 figs. on 2 plates. [4 refs.]

A brief account of H's previous work [*V. B.* **2.** 308.] relative to modern conceptions of melanin production. Melanin was produced artificially in rabbits by injection of diphtheria toxin. A growth of black hair resulted around the needle punctures.—E. G. WHITE.

KRAUSE, C. (1938). Ueber das Leberadenom und den Leberkrebs der Rehe, mit besonderer Berücksichtigung der Histogenese. [**Adenoma and Cancer of the Liver in Roe Deer**].—*Arch. wiss. prakt. Tierheilk.* **73.** 1-24. 6 figs. [13 refs.]

Primary epithelial tumours are said to be common in deer; 15 cases are described, including eight encountered by K. Affected animals were more than five years old.

The tumours are usually single, and produce secondary deposits in the local lymph nodes and lungs. Necrosis, haemorrhage and thrombosis are common.

The histological features are similar to those of liver neoplasms in man, both bile duct and liver cell types being found. It is suggested that the frequency of severe strongyle infestation of the stomach and intestines may be in some way related to the high incidence of these tumours.—E. G. WHITE.

FITCH, L. W. N. (1938). **Fowl Leucaemia (or Fowl Leucosis).**—*N. Z. J. Agric.* **56.** 259-262. 5 figs.

The occurrence in New Zealand of a myelogenous form of leucaemia is recorded. The condition has been transmitted by inoculation of liver emulsions.

HOLE, N. H. (1937). **" Russell Bodies " or Hyaline Droplet Degeneration of Plasma Cells in the Portal Canals of the Sheep's Liver.**—*J. comp. Path.* **50.** 299-302. 3 figs. [6 refs.]

The hyaline granules first described by RUSSELL in tumour cells, and believed by him to be the aetiological agent of cancer, are now known to represent a form of hyaline droplet degeneration. A few references to their occurrence in animal tissues have appeared.

The granules are here described as occurring within plasma cells in the portal tracts of the liver of sheep, there being no definite indication of their significance. They have not been found in the liver of human beings, horses, pigs or dogs. —E. G. WHITE.

REICHLE, H. S. (1938). **Bronchiogenic Distribution of Fluid and Particulate Matter. Its Site of Predilection and the Mechanism of Transfer.**—*Arch. Path.* **25.** 811-818. 5 figs. [6 refs.]

Fifty cases of pulmonary tuberculosis or pneumonoconiosis in human beings, in which the lesions where predominant in restricted areas, were examined and in 27 cases the lesions were confined to a " transverse band area ", extending across each lung. On the assumption that these lesions were due to bronchiogenic distribution, indian ink was injected in small quantities into the trachea of g. pigs and rabbits. The animals were killed by ether inhalation a few minutes after injection, and the pigment was found to be deposited in the transverse band area. Animals exposed to a charcoal-laden atmosphere showed diffuse pigmentation of the lungs. The examination of serial sections of rabbits treated with indian ink suggested that the grooves on the lateral surface of the bronchi are the cause of this lateral shunting of fluid or particulate matter in suspension.—A. T. PHILLIPSON.

## NUTRITION IN RELATION TO DISEASE

THOMAS, A. D., & VAN DER WATH, J. G. (1937). **Bone Biopsy as an Aid to the Study and Diagnosis of Deficiency Diseases.**—*Onderstepoort J. vet. Sci.* **8.** 431-439. [2 refs.]

The usual procedure when studying the effect of deficient diets on animals is to observe the changes which take place in the body generally, and the bones in particular, of animals in experiment which have died or have been killed. The method of studying portions of bone removed from the animals during life, usually a portion of one rib, has many advantages, can be applied to any animal species, and is a great saving in material; the bone changes at different stages of an experiment can be studied.—E. M. ROBINSON.

HART, G. H. (1938). **Dietary Deficiences and Related Symptomatology in Domestic Animals.**—*J. Amer. vet. med. Ass.* **92.** 503-517. [8 refs.]

This is a general article concerning the place of nutrition with regard to animal health, and deals with the various diseases arising from a deficient intake of minerals and vitamins. It is pointed out that the rations of cattle and sheep, particularly under range conditions, are often low in P, but rich in Ca, whereas those of pigs and poultry subsisting largely on concentrates are rich in P, but low in Ca. Other mineral deficiencies discussed are those of Fe and its associated elements, and of iodine. The various diseases in the domestic animals arising from deficiencies of vitamins A, D, E and G are dealt with.—N. J. SCORGIE.

WHALLEY, Muriel E. (1937). **Bibliography on the Influence of Mineral Deficiencies on Growth and Reproduction of Farm Animals.** pp. 89. Ottawa: National Research Council of Canada. [4to] [Mimeographed] [50 cents].

This is a list of 987 references to the literature on mineral deficiency in farm animals published up to the end of 1936. They are arranged alphabetically under the authors' names, with a subject index at the end.

METZGEN, H. J., & MORRISON, H. B. (1937). **The Occurrence of Milk Fever in the Kentucky Station Herd over a Period of Twenty Years.**—*Proc. Amer. Soc. Anim. Prod. 1936.* pp. 48-52.

During the long period of observation the herd of 218 cows of breeding age consisted mainly of Jerseys, together with some Holsteins, Guernseys and four cross-breds. The records showed that there was an increase in the number of cases of milk fever during the winter and that the Jerseys were more susceptible than the other breeds.—R. ALLCROFT.

ANTIGNAC, J. F. A. (1934). Contribution à l'étude de la tétanie d'herbage des bovidés. [**Grass Tetany in Cattle**].—*Thesis, Alfort.* pp. 111. [Num. refs.]

Clinical notes are given on nine cases of bovine grass tetany, and the somewhat speculative conclusions are based on these.

It is considered that grass tetany is primarily a disease of milking cows, most common in older animals exhausted by many parturitions, and that it is due to bad feeding, with an excess of protein food and a shortage of minerals. The excess protein results in great absorption of nitrogenous products at varying stages of breakdown, which interferes with proper absorption and reacts *via* the endocrine and sympathetic-nervous mechanisms on the mineral metabolism.

Ca and Mg therapy are recommended, and also a more balanced winter ration, with a gradual transition from stall to pasture feeding.—R. ALLCROFT.

I. Huffman, C. F., & Duncan, C. W. (1936). **Magnesium Carbonate and Magnesium Oxide Supplements to a Whole Milk Ration for Dairy Calves.**—*J. Dairy Sci.* **19.** 440-441.

II. Knoop, C. E., Krauss, W. E., Sutton, T. S., & Washburn, R. G. (1937). **Iron and Copper in a Normal Calf Ration.**—*Bi-m. Bull. Ohio agric. Exp. Sta.* No. 188. pp. 129-135. 8 tables. [1 ref.]

III. Sampson, J., Boley, L. E., & Graham, R. (1938). **Losses of Newborn Calves Presumably the Result of Feeding Dams Rations Inadequate for Reproduction.**—*Cornell Vet.* **28.** 53-57. 1 table. [7 refs.]

I. It has been previously shown [*V. B.* **7.** 252.] that calves fed a whole-milk ration often manifest tetany associated with subnormal plasma magnesium. In this respect the authors state that there appears to be considerable variation in the magnesium requirement of calves, but that 15-20 mg. of the oxide or carbonate of magnesium per lb. body weight prevents the onset of tetany when the calves are fed on an experimental diet otherwise free from magnesium.

II. This study indicates that the feeding of extra Cu and Fe to calves receiving milk, alfalfa or mixed hay, and grain, probably has no beneficial effects. According to this work a calf ration, on a dry basis, which contains 0·0176% Fe and 0·0013% Cu furnishes adequate amounts of these minerals for normal growth up to 8½ months of age.

III. This is a case report describing the loss of 84 new-born calves in a large herd kept under range conditions. Symptoms developed 5-6 hours after birth and consisted of profuse diarrhoea, anorexia, and death within 24 hours after the onset of symptoms. Treatment of affected animals was useless. P.M., the livers of six out of 13 calves examined showed extreme fatty infiltration. Biochemical and bacteriological examinations of the tissues were negative. The evidence indicated that the diet of the dams was low in vitamin A and in minerals, and this is supported by the fact that the calf mortality ceased when the cows were provided with grain, hay, protein, mineral supplement and rye pasture.—N. J. S.

I. Askew, H. O., & Maunsell, P. W. (1937). **The Cobalt Content of some Nelson Pastures.**—*N.Z. J. Sci. Tech.* **19.** 337-342. 4 tables. [5 refs.]

II. Dixon, J. K. (1937). **A Trial of the Effect of Cobalt Drench on Milk Production of Cows at Morton Mains.**—*Ibid.* 343-344. 2 tables. [3 refs.]

III. Josland, S. W., & McNaught, K. J. (1938). **Further Observations on the Production of Cobalt Polycythaemia in Rats.**—*Ibid.* 536-540. 2 figs., 4 tables. [7 refs.] [See also *V. B.* **7.** 249].

I. Data are presented for the cobalt content of several Nelson pasture samples throughout the year. Top-dressing with cobalt chloride at rates from 2-112 lb. per acre markedly increased the cobalt content of pasture.

II. Cobalt drenches to cows in a sick area had no beneficial influence on the milk yield.

III. Of eight rats which received 1 mg. of cobalt daily in a stock diet, only one developed a persistent polycythaemia. Some haemopoietic stimulation occurred in the remaining animals early in the experiment, but this effect was not sustained. Confirmatory evidence of storage of cobalt by cobalt-fed rats was obtained, the organs mostly affected being the liver, spleen, and kidneys.

—L. W. N. Fitch.

Hopkirk, C. S. M., & Grimmett, R. E. R. (1938). **Importance of Cobalt. Relationship to the Health of Farm Animals.**—*N.Z. J. Agric.* **56.** 21-24. 1 fig., 1 table.

Limonite has been used widely and successfully to prevent sickness supposedly due to cobalt deficiency and variously called " bush sickness ", " enzootic marasmus ", etc. The cobalt content of limonite was found to vary to such an extent in different samples that a cobaltized salt lick of known concentration is now preferred. As an alternative, cobalt may be given in drench form. It was found that sheep became sick on pasture containing less than 0·07 p.p.m. cobalt, while cattle remained healthy on pasture in which the cobalt level was as low as 0·04 p.p.m. Healthy pastures contained from 0·07 to 0·3 p.p.m. cobalt.

Zones of incidence of " bush sickness " are outlined and the influence of topography and stock management is discussed.—L. W. N. Fitch.

Ferguson, W. S., Lewis, A. H., & Watson, S. J. (1938). **Action of Molybdenum in Nutrition of Milking Cattle.**—*Nature, Lond.* **141.** 553. [2 refs.]

Spectrographic analysis of " teart " pastures in Somerset showed a much higher Mo content than for " non-teart " areas, but there was no apparent correlation between total or HCl-soluble Mo in soil as compared with herbage. Feeding soluble Mo salts to five dry cows at the rate of 1·36 g. Mo per head per day [estimated level of Mo ingestion on certain pastures] resulted in three animals showing loss of condition and extreme scouring, resembling the natural " teart " symptoms. The mode of action of Mo is unknown.—Alfred Eden.

Aldea, L. A. (1935). **A Study of the Consumption of Salt by Range Cattle.**—*Philipp. Agric.* **24.** 595-609. 1 fig., 7 tables. [9 refs.]

The amount of salt consumed by three groups of range cattle was measured over a period of 17 months. In all, 55 animals were used, and the average consumption of salt per head was 0·77 kg. over a period of four weeks (10·3 kg. per year). The figures showed no definite seasonal variation. In all groups, the amount of salt consumed during the first month of the experiment was greater than at any other period.—A. T. Phillipson.

Peck, E. F. (1938). **The Relationship of Salt Starvation to Contagious Necrosis and Lameness in Camels. (A Preliminary Note).**—*Vet. Rec.* **50.** 409-410. 1 graph.

This is a summary of clinical observations made on contagious necrosis of the skin and obscure shoulder and hip lameness of camels in Somaliland. The usual daily salt (crude coastal natural deposit) ration of 1-2 oz. fed to camels would appear to be inadequate ; if allowed salt *ad lib.* camels were found to consume an average of 4·3 oz. daily. When 5 oz. were given daily in the feed there was great diminution in the incidence of the above two conditions, together with a striking improvement in the general condition of the camels.—N. J. Scorgie.

McCance, R. A. (1938). **The Effect of Salt Deficiency in Man on the Volume of the Extracellular Fluids, and on the Composition of Sweat, Saliva, Gastric Juice and Cerebrospinal Fluid.**—*J. Physiol.* **92.** 208-218. 7 tables. [Numerous refs.]

Salt deficiency, produced by diet or by sweating, caused a decrease in the sodium and an increase in the potassium content of both the saliva and the gastric juice ; in the latter the free and total acidity and chlorides showed variable reductions or little change. The sodium and chloride content of the cerebrospinal fluid was lowered and that of the extracellular body fluids was reduced by 28-38%.

—A. T. Phillipson.

Turpeinen, O. (1938). **Studies on Sodium Deficiency. The Effects of Sodium Deprivation on Young Puppies.**—*Amer. J. Hyg.* **28.** 104-110. 1 fig., 1 table. [9 refs.]

Three young puppies, fed on a ration containing 0·011% of sodium but otherwise satisfactory, showed a steady loss in weight, relatively poor appetite, and dryness of the skin with a tendency to lose hair. They survived on this diet for about eight weeks and then died of cachexia. The one control animal used was given 0·38% of sodium and kept under observation for 11 weeks.

Blood analyses showed a decrease in the Na values of the three experimental puppies, but there were no marked changes in the K, Ca, Mg and inorganic P values. The non-protein nitrogen showed a definite premortal rise, but was otherwise normal. Electrocardiographic studies demonstrated no significant changes.—R. Allcroft.

Bussabarger, R. A., Freeman, S., & Ivy, C. A. (1938). **The Experimental Production of Severe Homogenous Osteoporosis by Gastrectomy in Puppies.**—*Amer. J. Physiol.* **121.** 137-148. 7 figs., 4 tables. [11 refs.]

When the stomach is removed from growing puppies which are fed on a diet adequate for normal animals, the bones do not ossify to a normal extent. The homogeneous osteoporosis thus produced is so severe that bony deformities and even spontaneous fractures result, giving a picture analagous to that observed clinically in severe cases of coeliac disease without rickets. The deficient ossification is apparently due to a combination of three factors :– (1) the absence of HCl, which normally renders the less soluble Ca salts more soluble and assists in the maintenance of an acid reaction in the intestine ; (2) the absence of the reservoir function of the stomach, so that the speed of intestinal transport of food substances is increased, and (3) the presence of a postcibal acidosis, which tends to decrease Ca retention.—R. Allcroft.

Wolf, H. J., & Tschesche, R. (1937). Die Milchanämie junger wachsender Ratten als Test fur die antianämische Wirksamkeit von Leberpräparaten. **[Milk Anaemia in Young Rats as a Test for the Anaemic Value of Liver Extract].**—*Hoppe-Seyl. Z.* **248.** 21-33.

A severe anaemia was produced by feeding young rats on a diet consisting of cows' or goats' milk. The haemoglobin content of the blood fell from 65% to 15%, the erythrocyte count from over six million to four million and the leucocytes from 8,000 to 4,000, within six weeks of their being put on the milk diet. The anaemia was thus of the hypochromic type, and injections of liver extract did not effect any change in the haemoglobin, but both the erythrocyte count and the leucocyte count returned to a normal value. Injection of copper sulphate did not produce any change in the blood picture, but the haemoglobin, erythrocyte and leucocytes quickly rose to normal after dosing with iron salts.

In the light of the above findings, the usefulness of young rats suffering from milk anaemia as test animals for gauging the therapeutic value of liver extracts appears to be limited, and the authors discuss this very fully.—James Stewart.

Bird, H. R., & Oleson, J. J. (1938). **Effectiveness of Chondroitin as the Anti-Gizzard Erosion Factor Required by Chicks.**—*J. biol. Chem.* **123.** xi-xii.

Pig's lung has been found to be a good source of the anti-gizzard erosion factor, but attempts at concentration have not been successful, although reticulin, a potent preparation of connective tissue protein, was obtained. The authors

then experimented with other types of connective tissue. Beef tendon and yellow elastic connective tissue gave doubtful results, but excellent protection followed the feeding of 10% cartilage.

Chondroitin, used in the treatment of gastric ulcer in man, was fed as 3-4% of the ration, and had a marked protective action against gizzard lesions. Purified extracts appeared to be more potent than crude chondroitin. Active preparations were obtained by alkaline extraction or by 10% $CaCl_2$ extraction of cartilage. Experiments are now being made to determine the effectiveness of fractions of the chondroitin molecule and of related compounds. Glucosamine and glucuronic acid were found ineffective at relatively low levels. Galactose fed as 3% of the ration was not active.

Scorgie, N. J. (1938). **The Role of Vitamins in Animal Nutrition. A Brief Survey.**—*Vet. Rec.* **50.** 775-787. 1 table. [Numerous refs.]

The functions of vitamins and their relation to health are discussed, and the distribution of vitamins in the commoner feeding stuffs is conveniently summarized in a table. Since cod liver oil, a rich potential source of vitamins A and D is often sold adulterated with other oils, or else is of inferior quality, the importance of feeding grades of guaranteed potency is emphasized.—Alfred Eden.

Phillips, P. H., & Bohstedt, G. (1938). **Effects of a Bovine Blindness-Producing Ration on Rabbits.**—*J. Nutrit.* **15.** 309-319. 3 figs. [12 refs.]

The experiments reported showed that rabbits did not develop stenosis of the optic foramen when fed a ration known to produce this condition in calves. Apart from this, the symptoms developing in the two species were strikingly similar, *e.g.*, blindness and xerophthalmia, nervous disturbances, and failure to grow. Symptoms could be prevented or cured in rabbits by feeding adequate quantities of carotene or vitamin A. It is suggested that the causative factor in calves is likewise a deficiency of vitamin A in the diet.—N. J. Scorgie.

Elvehjem, C. A., & Koehn, C. J., Jr. (1935). **Studies on Vitamin $B_2$(G). The Non-Identity of Vitamin $B_2$ and Flavins.**—*J. biol. Chem.* **108.** 709-728. 1 fig., 5 tables. [Numerous refs.]

Experiments are described attempting the isolation of vitamin $B_2$, using the production of symptoms of pellagra in the chick for the assay. Data are included on the solubility in various reagents, precipitation reactions, and stability of the vitamin. Concentrates rich in flavins or lumiflavin prepared from autolysed liver and liver extract proved completely inactive in the prevention of pellagra in chicks, and it is concluded that vitamin $B_2$ is a chemical entity, separate and distinct from hepatoflavin.—R. Allcroft.

Birch, I. W., György, P., & Harris, L. J. (1935). **The Vitamin $B_2$ Complex. Differentiation of the Antiblacktongue and the "P.P." Factors from Lactoflavin and Vitamin B6 (So-called "Rat Pellagra" Factor). Parts I-VI.**—*Bio-chem. J.* **29.** 2830-2850. 13 figs., 5 tables. [Numerous refs.]

It is concluded from the experimental work described, that the human pellagra-preventing ("P.-P.") factor differs both from vitamin $B_6$ and from lactoflavin (two known components of the vitamin $B_2$ complex), and, therefore, that the "P.-P." factor should be regarded as a third component. The canine anti-blacktongue factor is also different from vitamin $B_6$ and lactoflavin. It was found that dogs lost weight and developed blacktongue, with symptoms including

diarrhoea and anaemia, when fed on a Goldberger maize diet containing large amounts of vitamin $B_6$, and the addition of lactoflavin had no curative action. Symptoms were prevented or cured by the addition of supplements of autoclaved yeast, fresh fish (containing negligible lactoflavin), or Eli Lilly liver powder 343 (containing negligible vitamin $B_6$). The anti-blacktongue factor may be identical with the human " P.-P." factor, but evidence is so far not conclusive. Dogs kept on " synthetic " diets, containing vitamin $B_1$ and lactoflavin, appear to need supplements of two further factors, one contained in maize (presumably vitamin $B_6$) and one in liver extract (" P.-P." or anti-blacktongue factor). It is supposed that the addition of maize to the diet helps in the production of regular symptoms of blacktongue, not so much because of a toxin present in it, but because in its absence the dog may sometimes develop vitamin $B_6$-deficiency instead of blacktongue. So-called " chicken pellagra " of ELVEHJEM and KOEHN [p. 40] appears to be distinct from vitamin $B_6$-deficiency, and its relation to human pellagra and blacktongue is undecided.

The extrinsic factor for pernicious anaemia also appears to be different from lactoflavin or vitamin $B_6$.—R. ALLCROFT.

STREET, H. R. (1937). **Production of Canine Blacktongue on Purified Diets.**—*Proc. Soc. exp. Biol., N.Y.* **36.** 602-603. [7 refs.]

Typical oral symptoms of blacktongue occurred in four dogs fed on a basal ration complete except for B vitamins but supplemented by a vitamin $B_1$ concentrate, while control dogs receiving the same ration with 6% autoclaved yeast added, remained healthy. These results confirm those of BIRCH, GYÖRGY and HARRIS [above] and so far there is little question that blacktongue involves in its aetiology a lack of some water-soluble dietary factor or factors found in the so-called vitamin B complex and distinct from vitamins B ($B_1$) and G ($B_2$).—R. ALLCROFT.

GUERRANT, N. B., MORCK, R. A., BECHDEL, S. I., & HILSTON, N. W. (1938). **Storage of Vitamin D in the Tissues of Growing Calves.**—*Proc. Soc. exp. Biol., N.Y.* **38.** 827-831. 1 table. [5 refs.]

An investigation on the storage of vitamin D in the blood and in the liver of young calves fed definite quantities of vitamin D in the form of cod liver oil concentrate or irradiated yeast for 164-210 days, showed that only a relatively small percentage of the antirachitic intake of the calf is stored in the blood and liver. The concentration of the vitamin per unit of weight was found to be approximately equal in the two tissues studied, but unless there are other tissues which serve as more efficient storage organs than the liver or the blood, the ability of the calf to store vitamin D appears rather limited.—R. ALLCROFT.

I. TELFORD, I. R., EMERSON, Gladys A., & EVANS, H. M. (1938). **Claim for Thyroid Subnormality in Vitamin E-Low Rats.**—*Proc. Soc. exp. Biol., N.Y.* **38.** 623-624. [6 refs.]

II. KNOWLTON, G. C., & HINES, H. M. (1938). **Effect of Vitamin E Deficient Diet upon Skeletal Muscle.**—*Ibid.* 665-667. 1 table. [5 refs.]

I. No histological subnormality of the thyroid was observed in the paralysed suckling young of vitamin E-low dams or in old animals (22 months of age) chronically deprived of vitamin E. Nor was it possible to detect any functional subnormality of the thyroid since the oxygen consumption of four normal rats and four vitamin E-low rats did not differ significantly.

II. A study of the functional capacity of the gastrocnemius muscles of adult rats reared on a vitamin E-deficient diet showed that dystrophic changes occurred

within six months. This was evidenced by a decreased maximal contractile power, and decreased creatine and increased chloride concentration of the muscles. Males were affected to a greater extent than females. These changes were associated with only minor histological changes and occurred without the appearance of gross symptoms. Addition of wheat germ oil to the diet gave complete protection against this muscle dystrophy.—R. ALLCROFT.

## PUBLIC HEALTH

KOLBE, F. (1937). Neueres über Fleischvergifter und Fleischvergiftungen III. **[Recent Advances in Meat Poisoning. III].**—*Z. Fleisch- u. Milchhyg.* **47.** 439-442 and 456-458.

This review, of which part I appeared in 1931 and part II in 1932, covers all aspects of meat poisoning and research on meat poisoning organisms. It is valuable for reference purposes, but cannot be abstracted, as it is already very condensed. —J. E.

TOBEY, J. A. (1937). **Recent Court Decisions on Milk Control (1934-37).**—*Publ. Hlth Rep., Wash.* **52.** 1038-1044. [Numerous refs.]

A series of court decisions in the U.S.A. concerning the validity of laws, ordinances, regulations, etc., relating to the pasteurization of milk, compulsory tuberculin testing of cattle, the liability of a milk dealer for a case of undulant fever caused by his milk supply, the imposition of fees for the inspection of dairy cattle, the rights of milk dealers in obtaining licences, the improper use of milk bottles, and the fixation of milk prices.—GWILYM O. DAVIES.

## THERAPEUTICS

TRÉFOUEL, J. (1938). De la chimiothérapie anti-protozoaires à la chimiothérapie anti-bactérienne. **[Chemotherapy of Bacterial and Protozoan Diseases].**—*Bull. Inst. Pasteur.* **36.** 385-410.

A very good review of the development of chemical agents capable of killing protozoa and bacteria in the living body. The early work on dyes (trypanred) and the idea of a therapeutic coefficient was followed by the fundamental work of EHRLICH on the arsenobenzols. Antimóny derivatives and other dyes were then studied, and the importance of certain chemical groups in definite positions, and of certain linkages on activity and toxicity, was determined. All these substances, however, were active only against protozoa and spirochaetes, and not against bacteria. Though MORGENROTH obtained interesting results with optoquine against bacteria, a further fundamental advance in bacterial chemotherapy was reached with the work of DOMAGK on prontosil. T. then describes the brilliant investigations of the French workers resulting in the discovery that the activity of prontosil is due to the simple substance p-aminobenzene-sulphonamide, which is liberated in the body from prontosil. The remarkable similarity in the chemical structure of sulphonamide and of various antimonial anti-protozoal agents (*e.g.*, atoxyl, stibamine) is stressed. The numerous investigations into the effect on chemotherapeutic activity and toxicity of changing various side chains are described, and here again certain positions and groups are extremely important. Thus the $SO_2$ group appears to be of paramount importance in the activity;

though at first it was believed that it would kill only haemolytic streptococci, it is now realized that effects on a variety of other organisms (meningococci, gonococci, etc.) can be produced. Lastly the fate of sulphonamide in the body is briefly discussed. T. includes a list of the various trade names under which p-amino-benzene-sulphonamide is sold.—J. M. Robson.

I. Klein, L. A., Scheidy, S. F., Kleckner, A. L., & Craige, A. H. (1938). **Studies of Sulphanilamide Action on the Cow : Preliminary Report.**—*Vet. Ext. Quart. Univ. Pa.* **38.** No. 70. 10-23. 5 tables. [5 refs.]

II. McCoy, O. R. (1938). **Infectiveness of Sulfanilamide in the Treatment of Trichiniasis in Rats.**—*Proc. Soc. exp. Biol., N.Y.* **38.** 461-462. 1 table. [4 refs.]

III. Ottenberg, R., & Fox, C. L., Jr. (1938). **Explanation for the Cyanosis of Sulphanilamide Therapy.**—*Ibid.* 479-481. 2 tables. [3 refs.]

I. The physiological effects of oral dosage of cows with sulphanilamide are increased temperature, diarrhoea, loss of appetite and decreased milk yield. An initial dose of 30-45 g. followed by 15 g. 12 hours later and then 7·5-15 g. every 12 hours, was sufficient to maintain a blood concentration of sulphanilamide of 1 mg. or more per 100 ml. Owing to the small number of animals used, the results of the effect of sulphanilamide upon mastitis of the *Streptococcus agalactiae* type are insufficient to warrant general conclusions. Cows with a previous history of mastitis showed decrease in the leucocyte count and in the number of streptococci in the milk following dosing with sulphanilamide. In animals showing clinical symptoms of mastitis, the use of the drug led to an improvement in the physical appearance of the milk, but in no case did the infection clear up, nor was there any significant drop in the leucocyte count. Encouraging results were obtained in cows which showed latent infection.

II. Rats dosed with *Trichinella spiralis* larvae, and treated with 125 mg. sulphanilamide daily for 12-16 days, developed as heavy a muscular infestation as did untreated controls, indicating that sulphanilamide was of no value in the treatment of trichinosis in rats.

III. A brief exposure of sulphanilamide to ultra-violet irradiation causes a strong violet colour to develop, readily absorbed by red blood cells, and the ease with which this change is brought about suggests that some such transformation in the body is the cause of the cyanosis shown by patients undergoing sulphanilamide treatment.—Alfred Eden.

I. Johnson, H. W., & Miller, W. T. (1938). **Note on the Use of Sulfanilamide in the Treatment of Chronic Bovine Mastitis Due to Streptococci.**—*J. Amer. vet. med. Ass.* **92.** 548-555. 3 tables. [4 refs.]

II. Stableforth, A. W., & Scorgie, N. J. (1938). **Entozon and Acriflavine for the Treatment of Chronic, Contagious Bovine Mastitis.**—*Vet. Rec.* **50.** 663-676. 1 fig., 11 tables. [Numerous refs.]

I. Sulphanilamide was given in the food twice a day, in one experiment six animals being given six doses of 75 grains and, in another, four animals receiving 16 doses of half an ounce. Bacteriological examination of the milk before and after the experiments showed that the treatment was without effect in all cases.

II. Treatment consisted in the relatively rapid injection of solutions of entozon or acriflavine into infected quarters.

In animals in milk, the solutions were allowed to remain for a short time (the " short " method), and the treatment was repeated at the end of a week. In dry animals, solutions were left in for 24 hours and with acriflavine one such treatment

only was given ; with entozon the treatment was repeated after a week's interval. Entozon was used at a strength of 1 : 1,250 and acriflavine at 1 : 10,000.

With entozon, cures were obtained in nine out of nine experimentally infected quarters, 43 out of 60 quarters affected with latent mastitis, and 13 out of 37 clinically affected quarters ; acriflavine cured 26 out of 29 quarters showing latent mastitis and nine out of 14 quarters clinically affected.—W. J. Ironside.

Garrod, L. P. (1938). **The Chemotherapy of Bacterial Infections.**—*Lancet.* **234.** 1125-1129 and 1178-1182. [Numerous refs.]

The present position in chemotherapy of sulphonamide derivatives is described in detail. The general scheme of dosage is reviewed and the mode of action discussed, with details of the experimental evidence which led to the conclusion that prontosil acts in the body by the liberation of sulphanilamide. The therapeutic value in various streptococcal, pneumococcal, staphylococcal, meningococcal and gonococcal infections, *Bacterium coli* infections of the urinary tract, and in various other conditions (*e.g.*, gas gangrene, typhoid, undulant fever, etc.) is reviewed. It is emphasized that specificity for individual bacteria varies with chemical structure, and that related compounds are at present being investigated for their actions on various organisms.—J. M. Robson.

Monet, P. (1938). Essai de traitement de la gastro-entérite infectieuse du chat par la carboxysulfamido-chrysoïdine. [**Treatment of Infectious Feline Gastro-Enteritis with Carboxysulphamido-Chrysoidine**].—*Thesis, Alfort.* pp. 81. [Numerous refs.]

The drug was given intramuscularly in 5% solution, and *per os* in tablets of 0·2 g. Usually 3-5 c.c. of the solution and one tablet were given every day. Convalescence was prolonged and the administration *per os* was continued during this period. The effect was not specific ; 54% of the animals recovered, although the mortality is usually 80% or more in cases not treated with prontosil.—J. M. R.

Levaditi, C., Girard, A., Vaismann, A., Ray, A., & Richard, G. (1937). Sur le 4-nitro-4′amino-diphénylsulfoxyde et son action dans la toxi-infection expérimentale de la souris. [**4-Nitro-4′Amino-Diphenylsulphoxide and its Action on Toxi-Infections in Mice**].—*C. R. Acad. Sci., Paris.* **205.** 1018-1020. [6 refs.]

Mice were inoculated intraperitoneally with gonococcal cultures mixed with mucin. All such animals receiving 5 mg. of the drug survived indefinitely ; with 1 mg., 80-90% survived ; 40% survived when two doses of 0·1 mg. were given. 10 mg. per 20 g. body weight by mouth produced no toxic effects.—J. M. Robson.

I. Schmidt, W. (1937). Die Behandlung des Galtes mit Argento-Weidnerit. [**Treatment of Mastitis with Argento-Weidnerit**].—*Berl. tierärztl. Wschr.* Oct. 22nd. 655-657. [3 refs.]

II. Helm, R. (1937). Der gelbe Galt und Versuche zur Heilung mit Entozon-Infusionen. [**The Treatment of Bovine Mastitis with Entozon**].—*Z. InfektKr. Haustiere.* **51.** 268-286. 4 tables. [17 refs.]

I. S. records the treatment of 33 cows affected with streptococcal mastitis by injection of argento-weidnerit into the udder. In 29 quarters of 22 cows the treatment was successful, while in 26 quarters of 11 cows no success was obtained. The treatment appeared to be more beneficial when applied to cows in full milk than to those in the dry stage. The results were based on microscopic and bacteriological examinations.

II. H. applied treatment by entozon infusion to the infected quarters of 33 dry cows. Only two of these were free from streptococci at the next lactation. —S. J. Edwards.

Panasenko, F. T. (1937). Lečenie striguščego lišaja u teljat hlorom. [**Chlorine Gas Treatment of Ringworm in Calves**].—*Sovyet. Vet.* No. 10. pp. 7-9. 5 figs., 1 table.

When the lethal action of chlorine gas on surface cultures of *Trichophyton* after exposure for at least one minute had been verified, it was tested on ten calves affected with ringworm. The affected parts were moistened and the Cl applied direct from a Kipp's apparatus for periods of 1-10 minutes. Ten minutes' treatment was effective, but three minutes' exposure was not.

Regan, W. M., & Freeborn, S. B. (1936). **The Effect of Flies and Fly Sprays on Certain Physiological Processes of the Dairy Cow.**—*J. Dairy Sci.* **19.** 11-28. 1 fig., 6 tables. [14 refs.]

The exposure of deep milking cows to large numbers of flies did not usually cause a serious fall in milk yield. *Stomoxys calcitrans* was the only species of fly which caused a significant fall, *viz*, 9·3%. The use of petroleum fly sprays greatly increased the fall in milk yield; this effect was greatest during hot weather, when a rise in body temperature as well as an increase in respirations occurred 24 hours after spraying. It was found that these sprays significantly reduced the amount of osmotic water (distinct from sweat) lost through the skin; this probably interfered with the thermo-regulatory apparatus of the cows.—A. T. Phillipson.

Harwood, P. D., Underwood, P. C., & Schaffer, J. M. (1938). **Treatment of Equine Strongylidosis with N-Butyl Chloride.**—*N. Amer. Vet.* **19.** No. 7. 44-46. 1 table. [2 refs.]

Three horses were given doses of 0·1 c.c. per lb. body weight of N-butyl chloride in 8-10 times its volume in linseed oil, and P.M. examinations showed that the treatment was highly efficient.

Two horses each given 1 c.c. per lb. body weight died in a few days.
—W. J. Ironside.

Wright, W. H. (1937). **Critical Tests with Various Dyes as Anthelmintics for Chickens.**—*Rev. Med. trop. parasit., Habana.* **3.** 125-132. 1 table. [4 refs.]

Several dyes were tested for their action upon a number of parasitic worms. Rose bengal 3-B, brilliant cresyl blue, dahlia, magdala red and auramine O had practically no anthelmintic action. Gentian violet given in small repeated doses was effective against *Strongyloides avium.* Azamine had some effect upon the *Raillietina sp.*, as also had brilliant green, but the latter was found to be toxic. None of the drugs tried was of any value against *Capillaria annulata, C. retusa, Tetrameres americana, Cheilospirura hamulosa, Amoebotaenia sphenoides, Davainea proglottina, Hymenolepis cantaniana,* or *Postharmostomum sp.*—W. J. Ironside.

Lührs, E. (1938). Ueber die Einwirkung ultravioletter Strahlen auf Parasiteneier. [**Action of Ultra-Violet Rays on Eggs of Parasites**].—*Dtsch. tierärztl. Wschr.* **46.** 385-386. 2 tables. [3 refs.]

Roundworms obtained from pigs at slaughter were kept at 37°C. for 48 hours, and the eggs produced during this period placed in shallow dishes. Some of these were exposed to ultra-violet rays from a quartz lamp for 5-60 minutes. Six days after the exposure no development was seen in eggs exposed for ten minutes or

longer, whereas the control dishes contained viable larvae. Similar results were obtained with liver fluke eggs. The amount of water in the dishes affected the results: eggs covered by 10 mm. water were afforded some protection, but even with a covering of 1 cm. of water protection was not complete.—J. A. NICHOLSON.

TREMKÓ, F. (1937). Paresis puerperalis orvoslása. [**Treatment of Milk Fever**]. —*Állatorv. Lapok.* **60.** 175.

T. reports success in the treatment of milk fever in 200 cows with caffeine and sodium salicylate given intravenously. [No reason is given for failure to use rational treatment].—Z. DE CSUKÁS (MAGYARÓVÁR).

RUBAY, & BERTRAND. (1938). Contribution à l'étude des effets biologiques et du métabolisme du calcium. [**Calcium Metabolism**]. –*Ann. Méd. vét.* **83.** 97-112. 5 figs., 1 table. [8 refs.]

The authors studied the effect of intravenous injections of calcium gluconate on cows in which the blood calcium was regarded as normal. They found that injection of 50-60 g. of calcium gluconate rapidly caused marked respiratory and cardiac distress, profuse salivation and watering of the eyes, and muscular tremors; they interpreted these effects as being due to excitation of parasympathetic nervous system. After injection, the calcium level of the blood rose, but tended to return rapidly to normal. They concluded that this was due to the rapid immobilization of the excess blood calcium by the cells of the soft tissues, only a small fraction being eliminated by the kidneys and intestinal tract.—N. J. SCORGIE.

STEINMETZER, K., & GUDERA, R. (1938). Hexamethylentetramin bei Tieren mit alkalischen Harn. [**The Use of Hexamethylentetramine in Animals with Alkaline Urine**].—*Wien. tierärztl. Mschr.* **25.** 44-48. [2 refs.]

The presence of formaldehyde was tested in the urine by means of the very sensitive phloroglucin test. After the administration of hexamethylenetetramine to man and dogs, formaldehyde was present in the acid urine. No formaldehyde was present in the alkaline urine of the horse and the cow after the administration of the drug; after the administration of amphotropin, formaldehyde could be demonstrated in the alkaline urine of horses and cows.—J. M. ROBSON.

DIETRICH, S., & OETTEL, H. (1937). Behandlung von Blutungskrankheiten mit Pektinen. [**Treatment of Haemorrhagic Conditions with Pectins**].—*Dtsch. med. Wschr.* **63.** 1690-1694. 4 figs. [12 refs.]

Clinical investigations showed that pectins shorten the coagulation time of blood, increase the number of thrombocytes, and shorten the bleeding time. It is suggested that a general and unspecific action on the blood is exerted, and the clinical use of pectins is discussed.—J. M. ROBSON.

JAKUSEV, N. I. (1937). Vlijanie različnyh uslovií na barjernuju funkciu centraljnoĭ nervnoĭ sistemy lošadi pri encefalomielite. [**Influence of Different Conditions on the Barrier Function of the Central Nervous System of the Horse in Encephalomyelitis**].—*Sovyet. Vet.* Nos. 11-12. pp. 59-61.

The protective power of the blood-brain barrier in the horse, rabbit and dog is discussed.

Experiments on healthy horses, dogs and rabbits showed that, under normal conditions, the blood-brain barrier prevented such substances as bacteriophage, antitoxin and sodium iodide, injected intravenously or intramuscularly, from penetrating into the cerebrospinal fluid. This barrier was broken in horses with

encephalomyelitis. Bleeding (1/5-1/6 of total blood), warming followed by cooling, intravenous injection of a hypertonic NaCl solution, urotropin, bile, dinitrophenol or chloral hydrate broke the blood-brain barrier for a shorter or longer time and allowed bacteriophage, antitoxin or NaI to pass through.

J. suggests that this effect might be used when close contact of the nervous cells with a therapeutic agent is required.

Deanesley, R., & Parkes, A. S. (1937). **Factors Influencing the Effectiveness of Administered Hormones.**—*Proc. roy. Soc.* Ser. B. **124.** 279-298. 4 text figs., 4 figs. on 4 plates, 5 tables. [Numerous refs.]

Experiments are described on the effect of subdivision of the total dose, nature of the solvent, addition of fatty acid to the solution, esterification of the hormone, volume of medium and route of administration. Certain of the free hormones showed greatly increased effectiveness when given in dry form by the subcutaneous implantation of tablets or crystals, and very prolonged effects were obtained in some cases. In general it seemed that the free hormones lost their inferiority to the esters if the method of administration made absorption inevitably slow, whereas the esters lost their superiority to the free hormones if absorption was rapid or instantaneous.—J. M. Robson.

Engl, D. (1938). Put kojim idu capsulae i pilulae davane peroralno ovcama. **[The Course taken by Capsules and Pills after Peroral Administration to Sheep].**—*Vet. Arhiv.* **8.** 35-45. 2 figs., 2 tables. [20 refs.] [German summary].

In 84 sheep the course taken by capsules and pills after peroral administration was studied by means of röntgenograms. Capsules, whether administered alone or along with a fluid, usually entered the rumen ; a few entered the reticulum also, but never the omasum or abomasum. Small pills, if given with large quantities of one of the following fluids—a weak solution of sodium sulphate, chloride or carbonate, or of saccharose solution, milk, water or defibrinated blood—usually went into the reticulum rather than into the rumen, but sometimes they went directly into the omasum or abomasum. Thirst did not seem to play any role. E. concludes that the course taken by capsules and pills administered perorally to sheep cannot be much influenced by the manner in which they are administered. [See also *V. B.* **6.** 371].—B. Oswald (Križevci).

Greenwood, D. A., Hewitt, E. A., & Nelson, V. E. (1938). **The Effects of the Fluorides and Chlorides of some of the Alkali Elements on Respiration and Blood-Pressure in the Dog.**—*J. Amer. vet. med. Ass.* **92.** 532-547. 6 figs., 6 tables. [3 refs.]

Significant changes in respiration were produced by smaller quantities of fluorides than of chlorides of the same radical. Initial small doses of fluorides (except KF) caused a decrease, and of chlorides (except $NH_4Cl$), an increase in blood pressure, but larger doses of all the compounds studied produced a very low blood pressure. Fluorides in order of toxicity per kg. body weight are given as $NH_4F$, KF, $NaSiF_6$, and NaF, and similarly the chlorides as KCl, $NH_4Cl$, and NaCl, the cations being responsible to a large extent for the difference in toxicity of the various compounds of F and Cl.—Alfred Eden.

## POISONS AND POISONING

Bouchet, G., & Bouchet, A. (1938). Toxixité du nitrite de sodium. **[Toxicity of Sodium Nitrite].**—*Bull. Acad. vét. Fr.* **11.** 433-435.

Three pigs receiving accidentally about 125 mg. per kg. body weight of $NaNO_2$ instead of $KNO_3$ in a mash, died within 3½ hours. P.M. examination revealed congestion of the serous membranes, marked congestion in the kidneys, a pinkish coloration of the muscles, and the blood black, thickened and uncoagulated. The same mash offered to six horses was refused by all except one, which showed no ill-effects.—Alfred Eden.

Wilson, H. F., & Holmes, C. E. (1936). **Effect on Chickens of Arsenic in Grasshopper Bait. Little Danger in Eating Arsenic-Fed Chickens.**—*J. econ. Ent.* **29.** 1008-1014. 3 tables. [1 ref.]

The widespread use in Wisconsin of a poisonous grasshopper bait containing As led to an examination of its potential toxicity to poultry. Under cage conditions, fowls refused to consume the bait even when it was mixed with bran, and took slowly to bran to which As had been added, only a few deaths resulting. Analyses of the flesh and eggs of fowls fed on mash containing from 0·1 to 1% As showed that the As content was far too low to be dangerous to human beings consuming the flesh.—Alfred Eden.

Townson, W. K., & Gordon, R. F. (1938). **Acute Arsenical Poisoning in Fowls.**—*Vet. Rec.* **50.** 403-404. [3 refs.]

The authors describe the occurrence of mass poisoning in a flock of fowls, resulting in a heavy death rate. The outbreak was associated with the death of seven out of nine pigs, which showed intense gastritis and enteritis; the hens had been fed on the same meal as the pigs. Within a short time of feeding most of the hens became acutely ill. They showed swelling of the face, intense thirst, inappetence, cramps and partial paralysis. Out of a total of 150, 120 birds died.

P.M. examination revealed intense congestion of the skeletal muscles, and catarrhal inflammation of the proventriculus with sloughing of the mucous membrane, accompanied by a slimy exudate. The horny lining of the gizzard was separated from the muscular coat by a sero-fibrinous exudate, and the sub-epithelial layer showed diffuse haemorrhage and acute inflammation. Arsenic was found in the crop contents in the proportion of approximately one-tenth of a grain per oz. The source of the arsenic was not traced: there was a suspicion that it might have been given maliciously.—D. L. Hughes.

## PHYSIOLOGY

Blount, W. P. (1938). **Some Recent Advances in Veterinary Physiology and their Clinical Application.**—*Vet. Rec.* **50.** 833-848. [Numerous refs.]

In a rapid review, B. discusses acetylcholine and other substances affecting the vegetative nervous system, the adrenal cortex, nicotinic acid, choline, the anti-diuretic fraction of the pituitary, testosterone, oestrin (in its carcinogenic aspect), the liver, rumination, and sweating. His statements are subsequently modified or enlarged in the general discussion.

"Mecholin", an acetylcholine derivative, is recommended for clinical use. Nicotinic acid will cure pellagra-like lesions in pigs and blacktongue in dogs. The liver has powerful regenerative powers, and is able to perform its functions if only one-tenth of it is active. B. considers that there may be a hepatic factor in milk

fever, but his evidence is not convincing. The discovery of uric acid in the blood is a delicate test for hepatic disorder, but only positive results are of significance. —D. D. Ogilvie.

Zorn, W. (1936). Untersuchungen über einige wichtige Blutbestandteile beim Rind. [**Research on some Important Constituents of the Blood of Cattle**]. —*Festschrift J.U. Duerst.* pp. 415-427. 2 figs., 1 table. [In German]. Bern: Verbandsdruckerei.

The plasma proteins, albumin, globulin and fibrinogen and dried residue of blood showed considerable variation during the course of one day and over a period of four weeks. These variations did not seem to follow a regular course and did not occur simultaneously; thus feeding appeared to influence the total dry substance, but not the albumin, which appeared to be influenced by barometric pressure. At no time during the day was it possible to predict that these fractions would be present in the same proportions as they were on previous days. The albumin : globulin ratio was the most constant and showed only slight variations. —A. T. Phillipson.

Fedotov, A. I. (1937). Subokcipitaljnaja i cervikaljnaja punkcii subarahnoidaljnogo prostranstva u krupnogo rogatogo skota. [**Spinal Puncture in Cattle**]. —*Sovyet. Vet.* No. 10. pp. 31-34.

The cerebrospinal fluid of cattle can be obtained by tapping the subdural space with a needle inserted between the occiput and the atlas, or between atlas and axis, the animal being in lateral recumbency. The needle should be 9 cm. long and 2 mm. in bore.

Observations were made on the cerebrospinal fluid of 22 cows, 4 oxen and 6 calves. The following data are quoted verbatim :–

" The cerebrospinal fluid of cattle is an odourless and transparent liquid. Its specific weight is 1·006-1·007; surface tension, approximately 0·967; pH, 7·4-7·6 (by the method of Michaelis); alkali reserve, 420-480 mg. (Nevodov, modified by Fedotov); protein, 0·115-0·2% (Roberts-Stolnikov); sugar, 54-60 mg. % (Gedorn-Jenssen); calcium, 52-61 mg.% (de Vaard), and NaCl, 620-760 mg. (Bangou).

Globulin tests by the methods of Nonne-Apelt, Pandy and Wierhold and the oxydation test of Benedeck-Furso and Friedman were, as a rule, negative in all our experiments. Cytological tests, using Fuchs-Rosenthal's chamber, showed that the cerebrospinal fluid of cattle normally contains no more than 1-6 lymphocytes [? per field].

It is not advisable to withdraw more than 100 c.c. of fluid at a time, as this breaks the equilibrium pressure of the cerebrospinal fluid."

Bilek, F. (1936). Die Trächtigkeitsdauer beim Pferd und Esel. [**Length of Pregnancy in the Horse and Ass**].—*Festschrift J.U. Duerst.* pp. 17-23. 3 tables. [8 refs.] [In German]. Bern: Verbandsdruckerei.

B. gives the conclusions drawn from statistical analysis of the data from many studs in Czechoslovakia. It was found that blood mares generally had shorter pregnancies than mares of coarser breeds; mares tended to carry their first foal for a shorter period than subsequent foals; those which foaled in summer had longer pregnancies than those foaling in winter; male foals, on an average, were carried three days longer than female foals by blood mares, but no difference was found in coarser breeds; old stallions sired many more male foals than did young stallions.—A. T. Phillipson.

Roos, J., & Romjin, C. (1938). **Some Conditions of Foetal Respiration in the Cow.**—*J. Physiol.* **92.** 249-267. 6 figs., 8 tables. [13 refs.]

The oxygen capacity of blood from 11 non-pregnant cows lay between 10·28

and 18·45 volumes %. Foetal blood was obtained from the umbilical vessels, following caesarian section under local anaesthesia, on cows in the last two months of pregnancy. Foetal blood was found to have a greater oxygen capacity than maternal blood, but the reverse was found on blood taken from calves and their dams during the first few hours after parturition, although the oxygen capacity of both had increased. The percentage saturation of foetal blood (91% saturation with oxygen and 45% saturation with carbon dioxide at 8½ months) was higher than figures quoted for foetuses of the sheep and goat during the last weeks of pregnancy. The difference in partial pressure of oxygen and carbon dioxide between the foetal and maternal arterial blood was 64 mm. of oxygen and 9 mm. of carbon dioxide; maternal blood leaving the placenta had still a higher oxygen and lower carbon dioxide pressure than the arterial foetal blood. The dissociation curves for foetal and maternal blood showed that, while the carbon dioxide curves were very similar, foetal blood was capable of becoming more highly saturated with oxygen at lower pressures than was the maternal blood; thus at 26 mm. Hg of oxygen the foetal blood was 80% saturated, and maternal blood only 50%. The similarity of the carbon dioxide dissociation curves indicated that this was not due to differences in reaction of the blood.—A. T. PHILLIPSON.

ROEMMELE, O. (1938). Ein experimenteller Beitrag zur Frage der Fettresorption der Mesenteriallymphknoten des Schweines. **[Fat Resorption of the Mesenteric Lymph Nodes of Swine]**.—*Z. Fleisch- u. Milchhyg.* **48.** 241-242. [1 ref.]

Fat is often found in the mesenteric lymph nodes of fattening pigs, especially between the ages of 9-12 months; the cut surface of the nodes has a characteristic appearance. In pigs fed on a diet supplemented by milk until slaughter, the mesenteric lymph nodes all showed marked fat resorption, while those of pigs fed on a diet of meal and water did not.—A. T. PHILLIPSON.

NESENI, R. (1938). Der Gehalt des Harnes unserer Haustiere an Vitamin C. **[Vitamin C Content of the Urine of Domestic Animals]**.—*Prag. tierärztl. Arch.* **18.** 137-152. 4 tables, 3 graphs. [Numerous refs.]

The ascorbic acid content of urine taken from slaughter house animals was estimated by Tillman's modification of Strohecker and Vaubel's method. Values found for horses and cattle varied from 4-5 mg. per litre of urine. Green feeding appeared to increase the output of ascorbic acid in the urine, and female animals usually gave a higher value than males. Urine from calves and pigs contained 16-26 mg. per litre.—A. T. PHILLIPSON.

JACKSON, S. M., & GORTNER, R. A. (1938). **A Study of the Proteins of the Inactive and Active Mammary Gland.**—*J. biol. Chem.* **123.** 719-727. 1 fig., 1 table. [Numerous refs.]

The proteins of udders from heifers, dry cows with inactive glands, and cows recently dry, but with active glands, were analysed. The inactive glands yielded more albumin than globulin, whereas in the active glands the ratio was reversed. The changes in the proteins appear to be rather in their physical than in their amino-acid composition.—A. T. PHILLIPSON.

SEIFERLE, E. (1938). Ovarialstroma und Ovarialzyklus. **[The Ovarian Stroma and Ovarian Cycle]**.—*Schweiz. Arch. Tierheilk.* **80.** 59-70. 3 figs. [13 refs.]

The ovarian stroma plays a direct part in the ovarian cycle by the role it takes in the formation, maturation and rupture of the follicle. Its indirect help consists

in the subsequent healing of the cavity and in the formation of the corpus luteum. The most active elements of the stroma are the spindle-shaped fibroblasts.

—A. T. Phillipson.

Jadassohn, Uehlinger, & Margot. (1938). Sur l'allongement de la tétine du cobaye par l'effet des hormones. (Nipple-Test).—Déductions pratiques. [**The Guinea Pig Nipple Test for Hormones**].—*Rev. Path. comp.* **38.** 570-579. 5 tables. [3 refs.]

Local application of solutions of equiline or oestrone (1$\gamma$ per c.c.) produced an increase in the length of the nipple. Equiline was more effective than oestrone. Application of urine from pregnant women also produced lengthening of the nipple, and the results on oestrogen content obtained by this method agreed with those obtained by the Allen-Doisy test.—J. M. Robson.

Dau, W. (1937). Versuche über den Hormonnachweis zur Trächtigkeitsdiagnose der Stuten mit besonderer Berücksichtigung des Zellbildes des Vaginalsekretes der Mäuse und Ratten. [**Hormonal Diagnosis of Pregnancy in Mares**].—*Inaug. Diss., Berlin.* pp. 38. 4 figs. on 2 plates. [Numerous refs.]

The findings of Fritz [*V. B.* **6.** 768.] were confirmed. A diagnosis could be obtained in 65-70 hours. Both treatment with ether and heating decreased the toxicity of the urine. The rat is a better test animal than the mouse. It is technically preferable to perform the test on serum rather than on urine.—J. M. R.

## TECHNIQUE AND APPARATUS

Kergel, G. (1937). Farbmessungen am Blutserum gesunder Pferde mit dem Pulfrich-Photometer zur Ermittlung der normalen Schwankungsbreite. [**Colour Tests on Equine Blood Serum**].—*Inaug. Diss., Berlin.* pp. 19. 3 tables, 7 graphs. [15 refs.]

Under normal conditions the colour of the serum remained constant over long periods and showed little diurnal variation. Withdrawal of water caused a deepening of the colour in 8-12 hours; when water was given the serum became clearer in 3-4 hours. Foods with a high or low pigment content affected the colour of the serum in a few hours.—J. M. Robson.

Gibson, R. B., & Lowe, R. C. (1938). **Isolation of Bilirubin from Hog Bile.**—*J. biol. Chem.* **123.** xli-xlii.

A brief description is given of two simple methods for the extraction of bilirubin from pig bile with chloroform. (1) The extract is dehydrated, filtered and the chloroform recovered by distillation. The residue is extracted with ether, leaving crystals of bilirubin. The yield is about 2 g. from 20-25 litres of pig bile. (2) Pig bile is saturated with chloroform and the crystals of bilirubin which separate out are washed and recrystallized. The yield is about one-sixth the bilirubin content.

—R. Allcroft.

Voss, K. (1937). Farbreaktionen der Sexualhormone. [**Colour Reactions of Sex Hormones**].—*Hoppe-Seyl. Z.* **250.** 218-220.

A new modification of the nitrosonaphthol reaction; this was specific for p-substituted aromatic oxy-compounds. Different colours were obtained with different compounds from which it could be determined whether the compound contained a single or a condensed aromatic ring system. The follicular hormone gives a positive reaction in a concentration of $1 : 10^5$.—J. M. Robson.

I. Pullar, E. M. (1936). **Curdled Blood. A Simply Prepared Fluid Medium for the Cultivation of Anaerobes.**—*J. Bact.* **32.** 131-133. [1 ref.]

II. Spray, R. S. (1936). **Semisolid Media for Cultivation and Identification of the Sporulating Anaerobes.**—*Ibid.* 135-155. [14 refs.]

I. A mixture of one volume of defibrinated blood and four volumes of nutrient broth is steamed, reshaken, tubed and autoclaved. The medium favours slight sporulation and is blackened by proteolysis. The fine debris does not affect ordinary staining methods. The method gave good results with several species of *Clostridium*.

II. 328 strains of sporulating anaerobes were classified into 20 species by selected physiological tests applied chiefly in semisolid media, which permitted abundant growth under conditions eliminating the tedium of customary anaerobic technique. Formulae for these media, methods of performing tests, and interpretations of the reactions are outlined. Certain newly-observed tests are recorded for the recognition of several species. A tentative key to 20 common species is given, affording in a few cases only group identification, as for the butyric acid group.—R. O. Muir.

Joyner, A. L., & Jones, C. P. (1937). **Individual Culture Dish with Increased Carbon Dioxide Tension.**—*J. Lab. clin. Med.* **22.** 1184-1185. [Copied *verbatim* from *Bull. Hyg., Lond.* **13.** 68. Signed G. S. Wilson].

A simple method is described for producing an atmosphere of 10 per cent. $CO_2$ inside a plate culture. The Spray anaerobic culture dish is used. Into one partition is introduced 1 c.c. of a molar solution of sodium bicarbonate (84 gm. to 1 litre of distilled water) sterilized by boiling or autoclaving, and into the other partition 1 c.c. of a 1/30 dilution of sulphuric acid. The inoculated Petri dish is inverted over the base and sealed with melted paraffin. The dish is then tilted and the two solutions are mixed. Since 22·4 c.c. of $CO_2$ are given off for each 1 c.c. of bicarbonate solution, and since the Spray dish has a cubic capacity of rather over 200 c.c., the resulting concentration of $CO_2$ is about 10 per cent. By this method excellent results have been obtained with plate cultures of the meningococcus and gonococcus.

I. Barnard, J. E., & Welch, F. V. (1936). **Microscopy with Ultra-Violet Light. A Simplification of Method.**—*J. R. micr. Soc.* **56.** 365-371. 4 text figs., 6 figs. on 2 plates. [3 refs.] [See also *V. B.* **8.** 476].

II. Hagemann, P. K. H. (1937). Virus-Fluoreszenzmikroskopie. Eine neue Sichtbarmachung filtrierbarer Viruskörperchen. [**Fluorescence Microscopy**].—*Münch. med. Wschr.* **84.** 761-765. 1 fig. [9 refs.]

III. Albien. (1937). Fluoreszenzmikroskopie, eine neue und grosse Möglichkeiten schaffende Arbeitsmethode in der Virusforschung und Bakteriologie. [**Fluorescence Microscopy in Bacteriology and Virus Research**].—*Tierärztl. Mitt.* **18.** 473-474.

IV. Anon. (1937). **Fluorescence Microscopy.**—*Lancet.* **233.** 91-92. [1 ref.]

V. Hagemann, P. K. H. (1937). Fluoreszenzmikroskopische Untersuchungen über Virus- und andere Mikroben. [**Fluorescence Microscopy Investigations on Micro-Organisms**].—*Zlb. Bakt. I.* (*Orig.*). **140.** 184-193.

[The principle of this method of examining virus smears is that numerous substances glow brightly when exposed to ultra-violet light, the colour varying with the substance exposed].

I. The image is focussed in visible light from a mercury vapour lamp using a glass objective and a special double sub-stage condenser. The outer part of

this condenser is of glass for dark-ground illumination with visible light, and the central part is of quartz for ultra-violet light. When focussing is complete, by a special arrangement the glass objective is replaced by one of quartz without upsetting the adjustments, and the ultra-violet light is turned on. The fine adjustment is moved by a predetermined amount and the object is ready for photographing. The ultra-violet light is supplied by one of the new high-voltage discharge lamps instead of by a temperamental spark gap.

II. Smears of the virus-containing substance are immersed for a few seconds in primulin (a dyestuff). When illuminated with ultra-violet light under the microscope, the virus appears in the form of glowing particles against a dead black or faintly violet background. The examination must take place in a dark room.

H. was able to demonstrate the presence of mouse ectromelia virus, canary virus and pox virus, and virus-like structures in smears from Brown and Pearce rabbit tumour, foot and mouth disease, yellow fever and mosaic disease of tobacco plants.

The method is also applicable to bacteria and protozoa. It is only necessary that the bacterium or other body shall stain selectivity with a fluorescing dye. Blood smears of sleeping-sickness can be rapidly examined because the glowing trypanosome is easily seen.

III & IV. Annotations of II.

V. A lecture given by H. in which he discussed the history of fluorescent microscopy. The methods for staining bacteria and protozoa with fluorescent dyes were described. Sputum smears stained with Berberin sulphate and decolorized with acid alcohol were easier to examine, and revealed more tubercle bacilli using ultra-violet light, than similar smears stained with Ziehl-Nielsen and examined with visible light.—G. Slavin.

Temple, P. L., & Kon, S. Z. (1937). **A Simple Apparatus for Milking Small Laboratory Animals.**—*Bio-chem. J.* **31.** 2197-2198. 1 fig. [1 ref.]

A brief description is given of a simple milking machine for milking small animals such as rats, rabbits, g. pigs and mice.—R. Allcroft.

Appenzeller, W. (1938). Eine einfache Methode zur Besichtigung des Augenhintergrundes ohne Spiegel und ihre Brauchbarkeit beim Pferd, verglichen mit den üblichen Methoden. [**New Method of Examination of the Fundus of the Eye Without an Ophthalmoscope; Comparison with the Usual Methods. Comparative Examination of 200 Horses**].—*Arch. wiss. prakt. Tierheilk.* **72.** 424-444. 8 figs. [Numerous refs.]

The usual methods of examining the fundus of the horse's eye with the ophthalmoscope and the principles underlying them are discussed. A simple method of direct examination is described in which the observer, bringing the rays of light from a pocket lamp into his axis of vision and advancing with it close to the patient's eye, can observe with ease a large field of the fundus, provided the eye is emmetropic and its media transparent.

All the methods were systematically employed on 200 horses and the results compared. In 86% the above direct method was sufficient. In 3·3% severe turbidity of the optic media impaired all methods of examination of the fundus. In 7% there was myopia, in 1·7% irregular astigmatism and in 2% various lesions which rendered the direct method of examination unsuitable.—G. Williamson.

Kalwaryjski, M. B. E. (1938). Studia nad włośniami o metodzie impregnacji jodowo-srebrowej włośni miesniowych. [**Demonstration of Trichinella in**

**Muscle by Iodine-Silver Impregnation**].—*Wojsk. Przegl. weteryn.* **9.** 123-136. 4 figs. [4 refs.] [German summary].

K. describes his iodine impregnation method for the demonstration of trichinae in muscle sections [see (1928). *Zlb. Bakt. I. (Orig.).* **108.** 186].

Thin slices of infected muscle are placed in iodine-potassium iodide solution for ten minutes—different proportions being used for different sections (2 : 4 : 100, 0·5 : 1 : 100 or 0·1 : 0·2 : 100 in distilled water), washed in distilled water, decolorized in 2·5% sodium thiosulphate until the muscle tissue is clear, washed in distilled water, placed in a solution of 10% silver nitrate with strong ammonia (equal parts) until the iodine has disappeared from the trichinae, washed in distilled water, decolorized in 5% sodium thiosulphate, washed in distilled water and mounted in glycerin under a cover-slip.

The iodine in the trichinae is converted into silver iodide, which stains the worms dark, the intensity depending on the strength of the I-KI solution used; the colour is said to be stable, in contradistinction to the simple iodine impregnation method, in which the colour soon fades.

## MISCELLANEOUS

RICHARDSON, U. F. (1937). **The Influence of the Veterinary Profession on Empire Development.**—*J. comp. Path.* **50.** 303-306. [1 ref.]

Attention is drawn to the influence of the veterinary profession in Empire development, emphasis being laid on the work of THEILER and PITCHFORD in South Africa, Griffith EVANS in India, WATSON in Canada, Theobald SMITH in the United States of America and McFADYEAN in Britain, by the study and teaching on the subject of contagious diseases amongst animals, *e.g.*, trypanosomiasis, piroplasmosis, horse-sickness, and tick and virus diseases, and their control, prevention and eradication.

Such studies have led to successful emigration and production of healthy animals suitable for human food; a good example being the control of tick fever in Argentina and the U.S.A. over large areas, and the control of rinderpest and pleuro-pneumonia in other countries. Thus, large tracts of land which hitherto were waste have become available and suitable for the raising of stocks. Doubtless as the value of veterinary work at home and abroad becomes appreciated at its true worth, the greater will be the fields of animal production and the greater the necessity for veterinary workers.—T. DUNLOP YOUNG.

JEANNIN, F. (1938). Le vétérinaire colonial et ses spécialisations. [**The Work of a Colonial Veterinarian**].—*Rec. Méd. vét. exot.* **11.** 36-40.

The colonial veterinarian has many important functions to perform that are quite different from those of his colleagues in France. His principal work, doubtless, is in connexion with the control and, where possible, the eradication of contagious diseases. In addition he must have a knowledge of the selection and cross-breeding of animals; the breeding and feeding of them to suit the various requirements; methods of transport; the conditioning of skins and hides for conversion into leather, and much work in connexion with the milk industry.

The author speaks of the value of colonial veterinary services to the territories concerned, and of losses that have been suffered in the past owing to neglect to employ such services. He also speaks of game preservation.—T. DUNLOP YOUNG.

HUNTER, A. H. (1938). **Methods Employed for the Identification of Domesticated Animals.**—*Vet. Rec.* **50.** 529-535. 6 figs. [16 refs.]

H. reviews the various methods of marking animals, such as by the registered brands used in countries where animals roam over large territories, and also marks on the ears and horns, and tar, raddle, and scissor marks. Ear marking is also used to indicate age in hill stocks. He refers to nasograms or nasal impressions, and photographs of both sides of particoloured animals.

It has been suggested that one horn should be left free from all identity markings except for indication of state of health, *e.g.* to show reactors to certain diseases. Tattooing seems to be the most satisfactory method of marking.—T. D. YOUNG.

GERMANY. (1938). Bestallungsordnung für Tierärzte. [**Registration Order for Veterinarians**].—Suppl. to *Reichsgesundheitsblatt.* **13.** No. 13. pp. 12.

GERMANY. (1938). Bestallungsordnung für Tierärzte. [**Registration Order for Veterinarians**].—Suppl. to *Dtsch. Tierärztebl.* **5.** No. 5. pp. 12.

WIENDIECK. (1938). Die Bestallungsordnung für Tierärzte vom 16.2.1938. RMBI G.205. [**Registration Order for Veterinarians**].—*Dtsch. Tierärztebl.* **5.** 133-136.

Registration comes under the authority of the Reichsminister of the Interior. The regulations are set out in full, giving the personal qualifications for entry into the veterinary profession, the standard of previous education required for admission as a veterinary student, and details of the necessary courses of training, both theoretical and practical, and of the preliminary and final qualifying examinations. The courses and examinations may be taken in the Faculty of Veterinary Medicine of Berlin, Leipzig, Giessen or Munich universities or in the Veterinary College of Hanover, but the subjects for study and examination are laid down in strict detail. Periods of specialized practical training are compulsory, and after passing the final veterinary examination the candidate must do six months' practical work with a veterinarian, from whom a favourable report must be received by the Reichsminister of the Interior, before registration can be granted.—D. H. WILLSON.

DAUSCHER, G. (1938). Die Tierschutzsektion des Reichsvereines [der Tierärzte Osterreichs]. [**Proposals of the Reich Society of Austrian Veterinarians for the Protection of Animals against Cruelty in Transport**].—*Wien. tierärztl. Mschr.* **25.** 161-164 and 196-198.

Detailed recommendations are made concerning different kinds of transport, *i.e.*, by rail, road, sea and air.—D. H. WILLSON.

NORWAY. (1937). Rundskrivelse fra Landbrugsdepartementet. Opheting (pasteurisering) av melk m.v. til dyrefor. [**Circular from Ministry of Agriculture on Pasteurization of Milk, etc., Destined for Feeding of Animals**]. —*Norsk VetTidsskr.* **49.** 703-706.

This circular was published in accordance with earlier statutory rules and orders, by which all milk for animal feeding had to be pasteurized in certain counties and districts specially named by the Ministry of Agriculture. It indicates a number of such districts, and lays down that the milk must be heated to 85°C. (rapid method). Buttermilk must be produced from pasteurized cream. It is recommended that dairies should pasteurize milk for human consumption as far as possible. In this case, however, slow pasteurization may be employed. Rules for inspecting the milk used for animal feeding are given.—H. C. BENDIXEN.

MADAGASCAR. (1937). Règlement de police sanitaire des animaux à Madagascar et dépendances. [**Regulations with Regard to Animal Diseases**].—*Bull. Off. internat. Epiz.* **15.** 629-636.

Certain contagious diseases of ruminants, pigs, equines and bees are listed as notifiable by the owner to the appropriate official. Details of procedure following notification are given, with special reference to rabies and anthrax. Regulations are laid down governing animal export and import to and from particular countries. All expenses are payable by owners of affected animals. There follows a list of penalties for infringement of the regulations.—R. O. MUIR.

LEBLANC, T. J. (1937). **What the Medical Student Should be Taught about Vital Statistics.**—*Amer. J. publ. Hlth.* **27.** 1273-1276.

This short article is a plea for the teaching of elementary statistical methods to medical students.—F. W. PRIESTLEY.

LEITCH, R. H. (1937). **Mastitis Milk in Cheese-Making.**—*Agric. Progr.* **14.** 40-43.

This article describes the characteristic defects of mastitis milk in cheese making, and includes an account of experiments carried out by L. Such milk usually gives weak rennet coagulation and a soft, unsatisfactory curd which often requires lengthy pressure to shape it; the lactic acid fermentation process may be delayed for several hours, even when the infected milk is heavily diluted with normal milk. The cured cheese is defective in body and texture, and often in flavour; it is usually of a low market standard.

## OFFICIAL AND OTHER REPORTS

GREAT BRITAIN. (1938). **Twenty-Seventh Report of the Development Commissioners being for the year ended the 31st March, 1937.** pp. 176. London: H.M. Stat. Off. [8vo] [2s. 6d.]

Of the sum placed at the disposal of the Commissioners in 1936-1937, £53,251 was expended on veterinary research institutions by annually recurring or special grants, and £45,670 on animal genetics, animal nutrition, dairy research, pig husbandry, poultry research and animal breeding. The veterinary institutes were :– The Institute of Animal Pathology, Cambridge University; the Research Institute of the Royal Veterinary College, London; the Foot-and-Mouth Disease Research Committee, and the Animal Diseases Research Association of Scotland. Short accounts of the administration and finance of the research institutes are given. In addition to the sums mentioned above, grants are made for advisory work, including veterinary science, at various colleges and universities.

For research and administrative expenses at the Field Station, established for the purpose of providing better facilities for the study of animal diseases and other subjects, the Agricultural Research Council received a grant of £61,000.

The following grants were made for new buildings at Institutes engaged in research or agricultural education :– University College of Wales, £15,000; Reid Library of the Rowett Institute, Aberdeen, £4,000; and the Animal Diseases Research Association of Scotland, £9,800.

The investigations in progress at the institutions supported by the grants of the Development Fund are described in reports issued by the Departments and reviewed in the reports of the Agricultural Research Council.

One studentship for research in animal health and one veterinary scholarship were awarded.—J. C. WALLACE.

GERMANY. (1938). Die Verbreitung von Tierseuchen und die Ergebnisse der Schlachtvieh- und Fleischbeschau im Jahre 1935 nebst vorläufigen Angaben über die Zahl der beschauten Schlachtungen in den Jahren 1936 und 1937. Bearbeitet im Statistischen Reichsamt unter Mitwirkung des Reichsgesundheitsamts. **[Germany: Animal Diseases and Abattoir Returns for 1935].** pp. 124. Numerous tables, graphs, charts. Berlin: Paul Schmidt. [4to] [RM. 6·50].

The following notifiable diseases were present :– anthrax, bovine tuberculosis, swine erysipelas, glanders, fowl cholera, blackleg, foot and mouth disease, genital vesicular exanthema, sheep pox, swine fever and swine plague, rabies, fowl plague, equine mange and sheep scab. The other notifiable diseases (haemorrhagic septicaemia in cattle, dourine, rinderpest and contagious bovine pleuro-pneumonia were absent.

As usual, the report gives details of diseases observed in the various government districts, and also meat inspection statistics. The original should be seen for details.—J. E.

ITALIAN SOMALILAND. (1938). Relazione sull'attivita svolta nell'anno 1936-37. **[The Work of the Serum and Vaccine Institute, Italian Somaliland, for 1936-37].** [RAVAGLIA, F.]—*Nuova Vet.* **16.** 15-19 and 54-56. 4 tables.

The main work of the Institute was the production of RINDERPEST serum. Native breeds of cattle have been found to be better as serum producers than cattle imported from Kenya. The policy is to vaccinate as many cattle in the country as possible, and for this purpose four mobile units have been organized. The mortality rate of all vaccinated cattle did not exceed 0·5 %.

HORSE-SICKNESS is very prevalent, especially among army horses. Carpano's method of vaccination has been adopted with apparently successful results, but it is too early to assess its true value.

Numerous deaths among camels have been investigated. Strongylosis and *Trypanosoma brucei* infection accounted for the majority.

Human SMALLPOX vaccine is prepared on a large scale at the Institute, which also undertakes pathological research and the study of zootechnical problems.

Trypanosomiasis caused heavy losses amongst cattle and no satisfactory method of control had been found. Bayer 205 and arsenic trichloride proved to be of no prophylactic or therapeutic value. A natural infection with *Tryp. brucei* and *Tryp. simiae* [*V. B.* **8.** 633 and 634.] was shown to occur in pigs. These animals, however, were resistant to experimental infection with *Tryp. vivax*.

Fowl diseases were prevalent. The most important was a disease resembling fowl plague. Laryngotracheitis was also present in the territory.

Experiments in crossing Karakul rams with native sheep were highly successful. The resulting progeny show the characteristics of Karakul sheep and maintain their fertility.—J. A. NICHOLSON.

## BOOK REVIEWS.

D'HERELLE, F. (1938). Le phénomène de la guérison dans les maladies infectieuses. **[The Phenomenon of Cure of Infectious Diseases].** pp. 414. 7 text figs., 12 figs. on 6 plates, 10 tables. [Numerous refs.] Paris: Masson et Cie. [8vo] [Fr. 75].

Although the title does not suggest it, this book concerns bacteriophage, and it is the third book by the author on the subject. The first part is couched in

general terms, on the nature of bacteriophage, and the second deals with its connexion with immunity in general and certain bacterial diseases in particular, three only of the latter being infections of domestic animals—haemorrhagic septicaemia, fowl typhoid and strangles.

The author asserts that bacteriophage plays an important part in epidemiology and that outbreaks are brought to a close largely by the formation of specific 'phage which kills off the causal organism. He claims to have observed this is H.S. and F.T.

He advocates the wide use of 'phage to control bacterial infections.—J. E.

BRUMLEY, O. V. [V.S. Dean of the College of Veterinary Medicine and Professor of Veterinary Medicine, The Ohio State University, Columbus, Ohio]. (1938). **Diseases of the Small Domestic Animals.** pp. 597. London: Baillière, Tindall & Cox. [3rd Edit.] [8vo] [25s.]

This book is sufficiently well known not to require much comment. The fact that it has reached its third edition is proof in itself that it fulfils a need. One unusual feature is that, contrary to the usual tendency in subsequent editions, the pages have been reduced from 611 to 597.

The author has dealt in perhaps too concise a way with all the important diseases (medical and surgical) of the dog, cat and rabbit, and each disease is treated from the point of view of aetiology, pathology, symptoms, diagnosis and treatment where these particular headings apply. Fowl diseases are not included.

Although the title might convey the impression of a text-book with a " flavour " of pathology and bacteriology, these aspects are treated very cursorily; the book deals with clinical methods.

The subject matter has been brought up to date, and some subjects have been entirely rewritten. On the whole, however, there is comparatively little change, and the format remains the same.—GWILYM O. DAVIES.

SOUTHWELL, T. [D.Sc., Ph.D., A.R.C.Sc., F.Z.S., F.R.S.E., Walter Myers Lecturer in Parasitology, School of Tropical Medicine, University of Liverpool; formerly Director of Fisheries to the Governments of Bengal, and of Bihar and Orissa; Scientific Adviser and Inspector of Pearl Banks to the Ceylon Company of Pearl Fishers; Honorary Assistant, Zoological Survey of India; Internal Examiner in Parasitology at the University of Liverpool to the Royal College of Veterinary Surgeons], & KIRSHNER, A. [M.B., Ch.B. (Capetown), D.T.M. (Liverpool), F.Z.S. Formerly Assistant Lecturer in Parasitology, School of Tropical Medicine, University of Liverpool]. (1938). **A Guide to Veterinary Parasitology and Entomology for Veterinary Students and Practitioners.** pp. xvi+176. 123 figs., 12 diagrams. [4 refs.] London: H. K. Lewis & Co. Ltd. [2nd Edit.] [8vo] [10s.]

The second edition of this handy work contains all the descriptions of protozoa, cestodes, trematodes and nematodes parasitic in domestic animals, which made up the first edition [*V. B.* **8.** 334]. In the present book there is the useful addition of a short section of some 30 pages dealing with arthropod parasites. Although we do not always agree with the authors' system of nomenclature, and in spite of the fact that certain of the statements made in the first edition have remained uncorrected in the second, it is felt that the book can be thoroughly recommended as a guide, in virtue of its concise and clear descriptions, and its figures. Any alterations which we might be inclined to make are small and of minor importance in a work of this kind.—C. HORTON SMITH.

# Addresses of Bureaux.

IMPERIAL BUREAU OF SOIL SCIENCE,
Rothamsted Experimental Station, Harpenden, Herts., England.

IMPERIAL BUREAU OF ANIMAL NUTRITION,
The Reid Library, Rowett Research Institute, Bucksburn, Aberdeen, Scotland.

IMPERIAL BUREAU OF ANIMAL HEALTH,
Veterinary Laboratory, Ministry of Agriculture and Fisheries, Weybridge, Surrey, England.

IMPERIAL BUREAU OF ANIMAL BREEDING AND GENETICS,
King's Buildings, West Mains Road, University of Edinburgh, Scotland.

IMPERIAL BUREAU OF AGRICULTURAL PARASITOLOGY (HELMINTHOLOGY).
Winches Farm, Hatfield Road, St. Albans, Herts., England.

IMPERIAL BUREAU OF PLANT BREEDING AND GENETICS,
School of Agriculture, Cambridge, England.

IMPERIAL BUREAU OF PASTURES AND FORAGE CROPS,
Agricultural Buildings, Alexandra Road, Aberystwyth, Wales.

IMPERIAL BUREAU OF HORTICULTURE AND PLANTATION CROPS
East Malling Research Station, East Malling, Kent, England.

## INDEX VETERINARIUS

HALF-YEARLY ISSUE.

It has been decided that with volume 6 of *Index Veterinarius* and onwards the issue will be half-yearly. The *Index* will, therefore, appear according to the following schedule :-

| *Vol.* | *No.* | *Indexing Period (indexing done).* | *Date of Issue.* |
|---|---|---|---|
| 6 | 1 | 1938—Jan.-June | December, 1938. |
| 6 | 2 | 1938—July-Dec. | June, 1939. |

The quarterly issue ceased with part 4 of volume 5, issued in June, 1938. Thus, the first half-yearly issue will contain the indexing done in the period immediately following that covered by the last quarterly issue.

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